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SECTION 1

Automobiles, Commercial Vehicles, Tractors, Motor-cycles, Motor Boats and Aircraft.

BRIEF specifications of stock models. Names and addresses of manufacturers.

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"566 miles over terrible roads on 70 gallons of gas"

Atterbury dealers—undaunted by railroad embargoes—despite the worst road conditions in years—are daily bringing home their quota of Atterburys.

The trip of 566 miles from Buffalo to Philadelphia, over roads that defy description, was easy for the big Atterbury truck pictured above. Incidentally, the journey was made on 70 gallons of gas.

It is the trouble-proof simplicity of the Atterbury, plus well-nigh perfect construction—that makes such performance possible—makes for solid friendship between Atterbury owners and Atterbury dealers.

If the Atterbury is not already represented in your territory, it will pay you to investigate.

ATTERBURY MOTOR CAR CO.,
Buffalo, N. Y.

Have you bought your Fourth Liberty Bond?

MOTOR TRUCKS OF MAXIMUM SERVICE

ATTERBURY

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SECTION I

Automobiles, Commercial Vehicles, Tractors, Motorcycles, Motor Boats and Aircraft

Gasoline Automobiles

Brief Specifications, Prices and Names and Addresses of Manufacturers

Model No. or Name	Manufacturer's Name and Address	No. of Cylinders Bore and Stroke of Motor	Make of Motor	N.A.C.C., H.P.	Wheel-base	Size of Tires
Allen 41	Allen Motor Co., North and Wood Sts., Fostoria, Ohio	4–3¾x5	Own	22.5	112	32x3½
	Five-Passenger Touring $1195					
	Five-Passenger Sedan 1595					33x4
American 6 See page 27	American Motors Corp., Plainfield, N. J.	6–3⅛x5	Rutenber	23.4	122	32x4
	Five-Passenger $1685					
	Seven-Passenger 1785					
	Two-Passenger Sport-about 1765					
	Two-Passenger Speedster 1645					
Anderson 400C	Anderson Motor Co., Rock Hill, S. C.	6–3¼x4½	Continental	25.3	120	33x4
	Five-Passenger Touring $1575					
Anderson 400D	Anderson Motor Co., Rock Hill, S. C.					
	Convertible Sport Car 1575					
Anderson 400A	Anderson Motor Co., Rock Hill, S. C.					
	Seven-Passenger Touring 1650					
Anderson 400E	Anderson Motor Co., Rock Hill, S. C.					
	Five-Passenger Sedan 2450					
Anderson 400G70	Anderson Motor Co., Rock Hill, S. C.	6–3½x5¼	Continental	29.4	120	33x4
	Four-Passenger Sport 2350					
Anderson 400F70	Anderson Motor Co., Rock Hill, S. C.					
	Convertible Ultra-Sport Car 2350					
Apperson-Jack-Rabbit 8–18	Apperson Bros. Automobile Co., S. Main St., Kokomo, Ind.	8–3¼x5	Own	33.8	130	34x4
	Standard $2800					
	Seven-Passenger Anniversary Touring. 4000					34x4½
	Four-Passenger Roadster 4000					
Auburn 6-39	Auburn Automobile Co., S. Main St., Auburn, Ind.	6–3¼x4½	Continental	25.3	120	34x4
	Touring $1445					
	Chummy Roadster 1445					
	Four-Passenger Sport 1345					
Auburn 6-44	Auburn Automobile Co., S. Main St., Auburn, Ind.	6–3½x5¼	Continental	29.4	131	35x4½
	Four-Passenger Sport $1785					
	Seven-Passenger Touring ..... ——					
	Austin Automobile Co.—See Highway King.					
	Baker, R. & L. Co.—See Owen Magnetic.					
	Barley Motor Car Co.—See Roamer.					
	Bartholomew Co.—See Glide.					

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Gasoline Automobiles—(Continued)

Brief Specifications, Prices and Names and Addresses of Manufacturers

Model No. or Name	Manufacturer's Name and Address	No. of Cylinders Bore and Stroke of Motor	Make of Motor	N.A.C.C., H.P.	Wheel-base	Size of Tires
Bell	**Bell Motor Car Co., York, Pa**	**4-3¾x4¼**	**G. B. & S.**	**22.5**	**114**	**31x4**
See page 25	**Price** **$995**					
Biddle H	**Biddle Motor Car Co., Philadelphia, Pa**	**4-3¾x5⅛**	**Buda**	**22.5**	**121**	**32x4**
See page 23	**Price** **$2650**					
Briscoe B-4-24	Briscoe Motor Corp., Jackson, Mich	4-3 1/16x5⅛	Own	16.3	104	30x3½
Buick H-6-44-45-46-47	Buick Motor Co., Hamilton Ave., Flint, Mich	6-3⅜x4½	Own	27.3	118	33x4
	Three-Passenger $1495					
	Five-Passenger 1495					
	Four-Passenger Coupe 1985					
	Five-Passenger Sedan 2095					
Buick H-6-49-50	Buick Motor Co., Hamilton Ave., Flint, Mich	6-3⅜x4½	Own	27.3	124	34x4½
	Seven-Passenger $1785					
	Seven-Passenger Sedan 2485					
Cadillac 57	Cadillac Motor Car Co., 1343 Cass Ave., Detroit, Mich	8-3⅛x5⅛	Own	31.2	125	34x4½
	Chassis $2990					
	Two-Passenger 3520					
	Four-Passenger 3520					
	Seven-Passenger 3520					
	Four-Passenger Convertible Victoria 3915					
	Five-Passenger Brougham 4390					
	Chassis 3070					
	Limousine 4695	.....	.....	....	132	35x5
	Suburban 4640					
	Town Limousine 4660					
	Landaulet 4795					
	Town Landaulet 4810					
Case V	Case, T. M., Co., J. I., State & Douglas Sts., Racine, Wis	6-3½x5¼	Continental	29.4	125	35x4½
	Seven-Passenger Touring $2100					
	Four-Passenger Roadster 2100					
Chandler	Chandler Motor Car Co., 131st St., Cleveland, Ohio	6-3½x5	Own	29.4	123	34x4
	Seven-Passenger Touring $1795					
	Four-Passenger Touring 1795					
	Four-Passenger Coupe 2395					
	Seven-Passenger Sedan 2495					
	Seven-Passenger Limousine 3095					
	Four-Passenger Dispatch 1875	.....	.....	....	....	32x4
Chevrolet 490	Chevrolet Motor Co. of New York, 1764 Broadway, New York City	4-3 11/16x4	Own	21.7	102	30x3½
	Two-Passenger Roadster					
	Five-Passenger Touring					
	Two-Passenger Coupe					
	Five-Passenger Sedan	.....	.....	.....	....	31x4
Chevrolet FA	Chevrolet Motor Co. of New York, 1764 Broadway, New York City	4-3 11/16x5¼	Own	21.7	108	33x4
	Two-Passenger Roadster					
	Five-Passenger Touring					
	Five-Passenger Sedan	.....	.....	.....	....	33x4½
Chevrolet 8	Chevrolet Motor Co. of New York, 1764 Broadway, New York City	8-3¾x4	Own	36.4	120	34x4
	Four-Passenger Roadster					
	Five-Passenger Touring					
Cole 870-871-872	**Cole Motor Car Co., Indianapolis, Ind**	**8-3½x4½**	**Northway**	**39.2**	**127**	**33x5**
See page 27	**Seven-Passenger Tourster** **$2595**					
	Two-Passenger Roadster **2595**					
	Four-Passenger Sportster **2595**					
Cole 875	**Cole Motor Car Co., Indianapolis, Ind**					
	Seven-Passenger Toursedan **$3595**					
Cole 873	**Cole Motor Car Co., Indianapolis, Ind**					
	Four-Passenger Tourcoupe **3795**					
Cole 874	**Cole Motor Car Co., Indianapolis, Ind**					
	Seven-Passenger Toursedan **$3695**					
Cole 877	**Cole Motor Car Co., Indianapolis, Ind**					
	Four-Passenger Town Car					
Columbia	**Columbia Motors Co., Detroit, Mich**	**6-3¼x4¼**	**Continental**	**25.6**	**115**	**32x4**
See page 23	**Five-Passenger Touring** **$1550**					
	Four-Passenger Sport **1695**					
	Five-Passenger Sedan **2395**					

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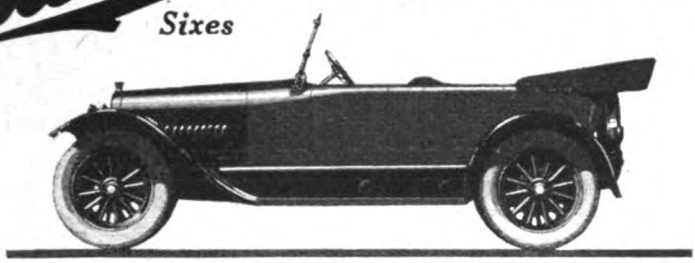
Mitchell Sixes

Mitchell D-40, 120 inch wheel base

Mitchell C-42, 127 inch wheel base



DISTINCTION, POWER, ENDURANCE IN THIS GREAT SIX

Mitchell owners are proud of their cars anywhere. The beauty of the Mitchell bodies gives them distinction in any group of fine cars. Their long, low lines make the Mitchell look the big car. And it is the longest, roomiest, handsomest Six in its division. Luxurious in equipment, ultra-comfortable through its shock absorbing springs.

The motor is a 40-horse power Six of the latest type turned out in the Mitchell factories.

Extreme endurance was an aim of the experts who planned the Mitchell Sixes. Endurance they surely have, as tests by thousands of cars under hardest road conditions have proved.

There is nothing in its class to compare with the Mitchell in price, appearance and practicability. But the output is limited and dealers and others are urged to place their orders early. There is sure to be a great shortage of cars in this division soon.

MITCHELL MOTORS COMPANY, Inc.

RACINE WISCONSIN

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Gasoline Automobiles—(Continued)

Brief Specifications, Prices and Names and Addresses of Manufacturers

Model No. or Name	Manufacturer's Name and Address	No. of Cylinders Bore and Stroke of Motor	Make of Motor	N.A.C.C., H.P.	Wheel-base	Size of Tires
Comet	Comet Automobile Co., 156 S. Water St., Decatur, Ill. Five-Passenger Touring.....$1685	6-3½x5	Continental	29.4	125	33x4
Crawford 18-6-40	Crawford Automobile Co., Surrey and Summit Aves., Hagerstown, Md. Seven-Passenger Touring.....$2250 Four-Passenger Sport..... 2250 Seven-Passenger Closed Foredoor..... 2750	6-3½x5¼	Continental	29.4	122½	33x4
Crow-Elkhart 32-34-36	Crow-Elkhart Motor Co., 1100 N. Main St., Elkhart, Ind. Two-Passenger Roadster.....$1095 Five-Passenger Touring..... 1095 Four-Passenger DeLuxe Roadster.... 1155 Five-Passenger DeLuxe Touring..... 1155 Five-Passenger Convertible Sedan.... 1445	4-3½x5	Own	19.6	115	32x3½
Cruiser See page 17	Cruiser Motor Car Co., Madison, Wis.					
Cunningham V3	Cunningham, Son & Co., James, Rochester, N. Y. Four-Passenger Touring.....$4250 Seven-Passenger Touring..... 4250 Two-Passenger Runabout..... 4250 Seven-Passenger Limousine..... 5500 Six-Passenger..... 4750 Four-Passenger Cabriolet..... 6000 Four-Passenger Limousine..... 6000 Six-Passenger Inside Drive..... 6000	8-3¾x5	Own	45.0	132	35x5
Daniels B	Daniels Motor Car Co., Reading, Pa. Touring.....$3500 Runabout..... 3250	8-3¼x5	Herschell-Spill.	33.8	127	34x4½
Dispatch G	Dispatch Motor Car Co., 1200 14th Ave., S. E., Minneapolis, Minn. Roadster.....$1150 Cloverleaf Roadster..... 1250 Touring..... 1250 Coupe..... 1400	4-4¾x5	Wisconsin	36.1	120	34x4
Dixie Flyer LS35	Dixie Motor Car Co., Third and K Sts., Louisville, Ky. Five-Passenger Touring.....$1095 Four-Passenger Roadster..... 1095 Five-Passenger Sedan..... 1450	4-3¼x5	Lycoming	16.9	112	32 3½
Dodge	Dodge Bros., 1678-1724 Jos. Campau Ave., Detroit, Mich. Touring.....$985 Roadster..... 985 Sedan..... 1425 Coupe..... 1425	4-3⅞x4½	Own	24.0	114	32x3½
Dorris 6-80	Dorris Motor Car Co., 4100 Laclede Ave., St. Louis, Mo. Seven-Passenger.....$3500	6-4 x5	Own	38.4	132	33x5
Dort 11	Dort Motor Car Co., 316 South St., Flint, Mich. Touring..... $925 Sedan..... 1325 Sedanet..... 1060	4-3½x5	Lycoming	19.6	105	30x3½
Dort 8	Dort Motor Car Co., 316 South St., Flint, Mich. Roadster..... $925 Coupe..... 1325					
Douglas G	Douglas Motor Corp., 30th and Spruce Sts., Omaha, Neb. Five-Passenger.....$2000 Four-Passenger Speedster..... 2250 Seven-Passenger..... 2200	8-3¼x5	Herschell-Spill.	33.8	122	34x4
Elcar 4	Elkhart Carriage & Motor Car Co., Elkhart, Ind. Four-Passenger Roadster.....$1175 Five-Passenger Touring..... 1175 Four-Passenger Touring..... 1175	4-3½x5	Lycoming	19.6	116	32x3
Elcar 6	Elkhart Carriage & Motor Car Co., Elkhart, Ind. Four-Passenger Roadster.....$1375 Five-Passenger Touring..... 1375 Four-Passenger Touring..... 1375	6-3¼x4½	Continental	25.3	116	33x4

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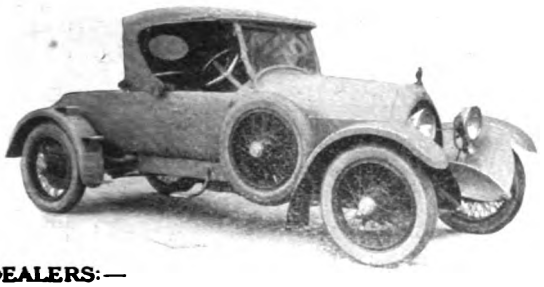
REVERE

The Motor Car That Has Created a New Standard of Automobile Construction



Specifications:

ENGINE — Duesenberg Racing Type. Four-cylinder, 4⅝", 6", 163 H. P.

Magneto—Bosch high tension.

Clutch—Multiple dry disc.

Starting and Lighting—Bijur.

TRANSMISSION—Four speeds forward and one reverse.

REAR AXLE — Full floating, spiral bevel gears.

WHEELS—32x4½ wood or wire wheels. Tires, Goodyear Cord.

WHEELBASE—130 inches.

BODY—Speedsters, sport style. Four passenger, Seven passenger.

PRICE — $3,750.00-$3,800.00, f.o.b. Logansport, Ind.

DEALERS:—

The ReVere is a most remarkable car—designed by Gil Anderson, Adolph Monsen and Tom Rooney.

The life experiences of these world renowned men stand back of its construction and the material it is composed of.

If you are a dealer in the center of a large population—write us and we will send you full details of our offer to such dealers, which means a connection of unusual possibilities.

Due to our limited output for 1918 we urgently advise getting in touch with us at once.

REVERE MOTOR CAR CORPORATION

Factory: Logansport, Ind. **CHICAGO, ILLINOIS**

CRUISER!

The only car in America with self-contained camping-out or touring equipment. Many patented features. Absolutely without competition.

Equipment includes electric lighted waterproof tent, bed, spring mattress, bedding, dining table, table service, chairs, refrigerator, fireless cooker, clothing compartments, pail, toilet tent, axe, hot water tank, cooking utensils, stove, etc.

All this equipment out of sight in the car. A practical complete up-to-the-minute, graceful car for business or pleasure.

Mr. Dealer.: A "Cruiser" in your showroom will be the attraction. Everyone in your locality will come to see the "Cruiser" and many will buy. Price complete with all equipment $1185.

Cruiser

Cruiser Motor Car Company
Factory: Madison, Wisconsin
Branch Office
706 Fisher Bldg., Chicago, Ill.

THE CRUISER IN CAMP

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Gasoline Automobiles—(Continued)

Brief Specifications, Prices and Names and Addresses of Manufacturers

Model No. or Name	Manufacturer's Name and Address	No. of Cylinders Bore and Stroke of Motor	Make of Motor	N.A.C.C., H.P.	Wheel-base	Size of Tires
Elgin F **See page 25**	**Elgin Motor Car Corp., Argo, Ill** **Five-Passenger Touring** $1235 **Military Scout** 1295 **Sedan** 1745	**6-3⅛x4½**	**Falls**	**23.4**	**118**	**33x4**
Empire 70-A	Empire Automobile Co., 15th St. and Big Four R. R., Indianapolis, Ind Five-Passenger $1475 Seven-Passenger 1475	6-3¼x4½	Continental	25.3	120	34x4
Empire 50	Empire Automobile Co., 15th St. and Big Four R. R., Indianapolis, Ind Five-Passenger Touring $1125 Two-Passenger Roadster 1165	4-3⅞x5	Teetor-Hartley	24.0	115	33x4
Ford T	Ford Motor Co., Woodward Ave. (Highland Park), Detroit, Mich Price $525	4-3¾x4	Own	22.5	100	30x3½
Franklin 9	Franklin Mfg. Co., H. H., 101 W. Marcellus St., Syracuse, N. Y Chassis $2475 Touring $2900 Two-Passenger Roadster 2850 Four-Passenger Roadster 2900 Brougham 3850 Sedan 3900 Limousine 4000	6-3¼x4	Own	25.3	115	33x4½
Ghent 4-38 **See page 51**	**Ghent Motor Car Co., Ottawa, Ill** **Price** $1185	**4-3¼x4½**	**Sommer**	**22.5**	**121**	**34x4½**
Ghent 6-60	**Ghent Motor Car Co., Ottawa, Ill** **Price** $1850 **Sedan** 2750	**6-3½x5¼**	**Continental**	**29.4**	**125**	**34x4½**
Ghent 6-45	**Ghent Motor Car Co., Ottawa, Ill** **Price** $1850	**6-3⅛x5**	**Rutenber**	**23.4**	**125**	**34x4½**
Glide 6-40	Bartholomew Co., Prospect Heights, Peoria, Ill Price $1655	6-3⅛x5	Rutenber	23.4	119	34x4
Grant G	Grant Motor Car Corp., Coit. Rd. & Kirby Ave., Cleveland, Ohio Touring Car $1095 Roadster 1095 Detachable Sedan 1350 All-Weather Sedan 1595 All-Weather Coupe 1575	6-3 x4¼	Own	21.6	114	32x3½
Harroun AA 1 **See page 25**	**Harroun Motors Corp., Wayne, Mich** **Touring** $895 **Roadster** 995	**4-3¼x5¼**	**Own**	**16.9**	**106**	**30x3½**
Haynes 39 **See page 19**	**Haynes Automobile Co., 9 S. Main St., Kokomo, Ind** **Five-Passenger Touring** $1900 **Seven-Passenger Touring** $1950	**6-3½x5** **35x4½**	**Own**	**29.4**	**127**	**34x4**
Haynes 44	**Haynes Automobile Co., 9 S. Main St., Kokomo, Ind** **Seven-Passenger Touring** $2910	**12-2¾x5**	**Own**	**36.3**	**127**	**34x4½**
Highway King	Austin Automobile Co., 114-18 Division Ave., S. E., Grand Rapids, Mich Touring $3750 Roadster 3750 Sedan 5000 Limousine 5250	12-2⅞x5	Weidely	39.6	142	34x4½
Hollier 188	Lewis Spring & Axle Co., 42 Hollier St., Chelsea, Mich Touring Car $1485	8-3 x4¼	Own	28.8	116	34x4
Holmes 1	Holmes Automobile Co., Crane Bldg., Canton, O. Seven-Passenger Touring $2550 Five-Passenger 2-Door Sedan 3500 Five-Passenger 4-Door Sedan 3600 Seven-Passenger Limousine 3750	6-3½x4¼	Own	29.4	126	34x4½
Hudson Super-Six **See page 19**	**Hudson Motor Car Co., Detroit, Mich** **Price** $1950	**6-3½x5**	**Own**	**29.4**	**125½**	**35x4½**

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The more a person familiarizes himself with the King "8" the more he appreciates what an exceptional car it is—both in looks and performance.

One chassis—three body styles. Touring, Foursome and Sedan.

KING MOTOR CAR CO.

1300 Jefferson Ave., Detroit, U.S.A.

Export Dept., 50 Union Square, New York

26th Successful Year

THE present Haynes represents far more than just a mechanical product. It is the composite attainment of twenty-five years of continual growth and development.

The Haynes-built six-cylinder engine, "America's Greatest Light Six," has endured for over four years without the necessity of a single radical change in construction—more than 20,000 owners testify to the satisfaction it gives.

Haynes "Light Twelves" also are the matured products of this unparalleled success.

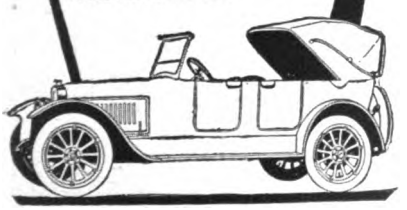
The Haynes Automobile Company

9 South Main Street Kokomo, Indiana

STANDARD "8"

The Magneto Equipped Eight

If every car on the market today were built in the heart of a 2½-mile-long steel plant, as the Standard "8" is, there would be no short-lived cars.



Built By

Standard Steel Car Co.

Factory: Butler, Pa.

Offices: Frick Building

PITTSBURGH, PA.

THE Hudson Company and Hudson dealers recognize their duty to Hudson owners as second only to the duty due to our country.

Efficient service stations with an ample supply of all replacement parts will be maintained throughout the war.

HUDSON MOTOR CAR CO.

DETROIT, MICHIGAN

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Gasoline Automobiles—(Continued)

Brief Specifications, Prices and Names and Addresses of Manufacturers

Model No. or Name	Manufacturer's Name and Address	No. of Cylinders Bore and Stroke of Motor	Make of Motor	N.A.C.C., H.P.	Wheel-base	Size of Tires
Hupmobile R **See page 23**	**Hupp Motor Car Corp., Detroit, Mich.** **Five-Passenger Touring** ..... **$1560** **Two-Passenger Roadster** ..... **1500** **Four-Passenger Sedan** ..... **2135** **Four-Passenger Coupe** **2100**	**4-3¼x5½**	**Own**	**16.9**	**112**	**32x4**
Inter-State T	Inter-State Motor Co., Muncie, Ind. Price $1000	4-3½x5	Beaver	19.6	110	33x4
Jackson 349	Jackson Automobile Co., Jackson, Mich. Price $1495	8-3 x3½	Ferro	28.8	118	34x4
Jordan	Jordan Motor Car Co., Cleveland, Ohio. Suburban Seven-Passenger Touring ... $2775 Sport Marine ..... 2775 Suburban Sedan ..... 2775 Brougham ..... 3200 Town Car ..... 3500 Limousine 4000	6-3½x5¼	Continental	29.4	127	32x4½
King **See page 19**	**King Motor Car Co., 1300 Jefferson Ave., Detroit, Mich.** **Seven-Passenger Touring** ..... **$2150** **Convertible Sedan** ..... **2950** **Four-Passenger "Foursome," Sport Type** **2350**	**8-3 x5**	**Own**	**28.8**	**120**	**34x4** **32x4½**
Kissel Hundred Pt. 6	Kissel Motor Car Co., 400 Kissel Ave., Hartford, Wis. Standard Touring ..... $1644 Standard Three-Passenger Roadster ... 1644 Gibraltar Touring ..... 1743 Gibraltar Four-Passenger Roadster .... 1743 Four-Passenger Open Sedan ..... 1853 Four-Passenger Sedan ..... 2293 Sedan 2128	6-3¼x5	Own	25.3	117	34x4
Kline 6-38 G	Kline Car Corp., 701-11 E. Carey St., Richmond, Va. Touring ..... $1695 Four-Passenger Sport ..... 1695 Shamrock ..... 1695 Three-Passenger Roadster ..... 1695 Seven-Passenger Sedan 2420	6-3¼x4½	Continental	25.3	121	33x4
	Lewis Spring & Axle Co.—See Hollier.					
Lexington R-19 **See page 29**	**Lexington Motor Co., 500 Park Pl., Connersville, Ind.** **Touring** ..... **$1785** **Convertible Sedan** ..... **1985** **Tourabout** **1685**	**6-3¼x4½**	**Continental**	**25.3**	**122**	**34x4**
Liberty 10-B	Liberty Motor Car Co., 111 Lycaste St., Detroit, Mich. Touring ..... $1385 Two-Passenger Roadster ..... 1570 Four-Passenger Roadster ..... 1570 Five-Passenger Sedan ..... 1925 Brougham ..... 2700 Landaulet 2700	6-3¼x4½	Continental	25.3	115	32x4
Locomobile 2-38	Locomobile Co. of America, 1 S. Main St., Bridgeport, Conn. Chassis ..... $4800 Touring ..... 5500 Torpedo ..... 5500 Four-Passenger ..... 5700 Limousine ..... 6900 Landaulet ..... 7000 Limousine (Enclosed Drive) 7100	6-4¼x5	Own	43.3	139	37x5
Locomobile 2-48	Locomobile Co. of America, 1 S. Main St., Bridgeport, Conn. Chassis ..... $5600 Touring ..... 6600 Torpedo ..... 6600 Four-Passenger ..... 6700 Limousine ..... 7700 Landaulet ..... 7800 Limousine (Enclosed Drive) 7900	6-4½x5½	Own	48.6	142	37x5

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Minneapolis Motor Car Co., Inc.

Manufacturers of

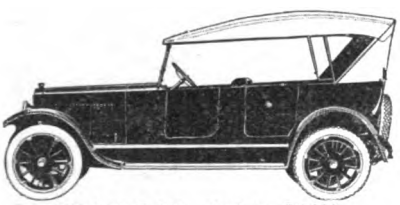
PLEASURE AND COMMERCIAL CARS

General Offices
235 PLYMOUTH BLDG.

Minneapolis **Minn.**

Paterson SIX

New Body Lines
120" Wheel Base

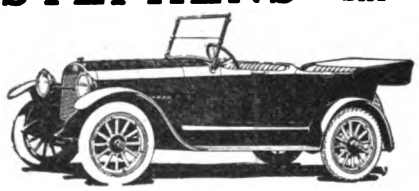


Model 6-46. Price, $1495.
Three Body Styles—Tires 34x4.

Our New Light Six with its long wheel base, Large roomy body, Standardized parts, and High grade equipment throughout is the sensation of the year.
Write for catalog.

W. A. PATERSON COMPANY
FLINT, MICHIGAN

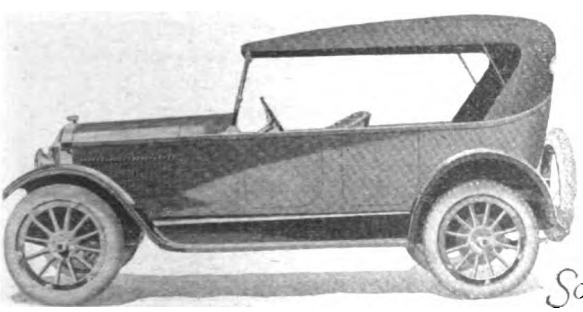
STEPHENS SALIENT SIX



A 57 horsepower Six with but 3¼ in. bore.
A perfected Overhead Valve Engine that **burns all the gasoline.**
Equipment complete and of the best, including every desired accessory.
Wheelbase, 118 inches; tires, 32 x 4, with non-skid on rear.

Write for Catalog Describing Our Five Models

STEPHENS MOTOR BRANCH
of Moline Plow Co.
Sales Office, Moline, Ill.
Factory, Freeport, Ill.



Model 6-39. Five Passenger, Six Cylinder

The New Scripps-Booth
Five Passenger, 6 Cylinder

Dealers will at once recognize in this newer, bigger and more powerful Model "6-39" a rare opportunity among the few *exceptional* values at a *very moderate* price, that are being exhibited at this year's shows.

Scripps-Booth Corporation
Detroit, Mich.

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Gasoline Automobiles—(Continued)

Brief Specifications, Prices and Names and Addresses of Manufacturers

Model No. or Name	Manufacturer's Name and Address	No. of Cylinders Bore and Stroke of Motor	Make of Motor	N.A.C.C., H.P.	Wheel-base	**Size of Tires**
McFarlan	McFarlan Motor Co., Mount and High Sts., Connersville, Ind.	6-4½x6	Teetor-Hartley	48.6	136	**35x5**
	Two-Passenger Roadster $3900					
	Four-Passenger Roadster 3900					
	Six-Passenger Touring 3900					
	Seven-Passenger Touring 3900					
	Four-Passenger Sport 4100					
	Four-Passenger Destroyer 4150					
	Town Car 5000					
	Knickerbocker Cabriolet 5650					
	"V" Front Sedan 5000					
	Sedan 5000					
	Berline 5300					
	Landaulet 5300					
Maibohm B	Maibohm Motors Co., 15th and Clark Sts., Racine, Wis.	6-3⅛x4½	Falls	23.4	116	**32x3½**
	Five-Passenger Phaeton $1260					
	Sedan 1860					
	Cabriolet 1860					
Maxwell 25 **See page 55**	**Maxwell Motor Sales Corp., Detroit, Mich.**	**4-3⅝x4½**	**Own**	**21.03**	**109**	**30x3½**
	Five-Passenger $825					
	Roadster 825					
	Berline Town Car 1450	....	....	....	....	**31x4**
	Sedan 1495					
Mercer, Series 4	Mercer Automobile Co., 500 Whitehead Rd., Trenton, N. J.	4-3¾x6¾	Own	22.5	115 / 132	**32x4 / 32x4½**
	Price $4000					
Midland A	Midland Motor Car & Truck Co., Penobscot Bldg., Oklahoma City, Okla.	6-3¼x4½	Continental	25.3	120	**32x4**
Minneapolis **See page 21**	**Minneapolis Motor Car Co., 235 Plymouth Bldg., Minneapolis Minn.**	....	....	....	....	....
Mitchell D-40 **See page 15**	**Mitchell Motors Co., Racine, Wis.**	**6-3¼x5**	**Own**	**25.3**	**120**	**32x4**
	Three-Passenger Roadster $1465					
	Five-Passenger Touring 1465					
	Five-Passenger Touring, Demountable Top 1650					
	Three-Passenger Coupe 1950	....	....	....	....	**33x4½**
	Five-Passenger Sedan 2250					
Mitchell C-42	**Mitchell Motors Co., Racine, Wis.**	**6-3½x5**	**Own**	**29.4**	**127**	**34x4**
	Five-Passenger Club Roadster 1735					
	Seven-Passenger Touring 1735					
	Four-Passenger Surrey 1750					
	Seven-Passenger Touring, Demountable Top 1925					
	Four-Passenger Cabriolet 2050	....	....	....	....	**35x4½**
	Four-Passenger Coupe 2225					
	Five-Passenger DeLuxe Sedan 2550					
	Seven-Passenger Touring Sedan 2400					
	Seven-Passenger Limousine 2850	....	....	....	....	**33x4½**
	Seven-Passenger Town Car 2850					
Moline-Knight C	Root & VanDervoort Engineering Co., Sixth St. and 13th Ave., East Moline, Ill.	4-3¾x5	Own	22.5	118	**34x4**
	Price $1750					
Moline-Knight G	Root & VanDervoort Engineering Co., Sixth St. and 13th Ave., East Moline, Ill.	4-4 x6	Own	25.6	122	**35x4½**
	Price $2375					
Monitor	Monitor Motor Car Co., Columbus, O.	6-3¼x4½	Continental	25.3	117	**33x4**
	Touring $1295					
	Four-Passenger Roadster 1295					
Moon 6-66	Moon Motor Car Co., 4400 N. Main St., St. Louis, Mo.	6-3½x5¼	Continental	29.4	125	**35x4½**
	Price $2500					
Moon 6-36	Moon Motor Car Co., 4400 N. Main St., St. Louis, Mo.	6-2⅞x4½	Continental	19.8	114	**32x3½**
	Price $1485					
Moore 30	Moore Motor Vehicle Co., Danville, Ill.	4-3¾x4¼	G. B. & S.	22.5	110	**30x3½**
	Five-Passenger Touring $995					
	Five-Passenger Sport 1045					

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To-day, PREMIER is known wherever motor cars are known, and

From a standpoint of prestige, it is unrivaled—in its price class.

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Indianapolis, Ind., U. S. A.

Hupmobile

The Comfort Car

Hupp Motor Car Corporation
Detroit, Mich.

Automobiles
BIDDLE

Series H

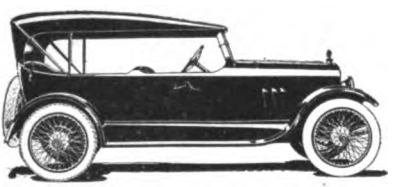
The name "BIDDLE" stands for all that is best in motor car construction. By aiming at a higher standard of quality than others, we have produced a car which is regarded by all as the standard of excellence. As conclusive evidence of this fact, those in a position to choose the best invariably select the "BIDDLE."

Four Cylinders — Four Speeds Forward

Valuable Territory Still Available

BIDDLE MOTOR CAR COMPANY

PHILADELPHIA **PENNA., U. S. A.**



Columbia Six

"Gem of the Highway"

Continental Motor
Timken-Detroit Axles
Non-Synchronizing Spring Suspension
Harrison Radiator
Thermostatically Controlled Radiator Shutter
Spicer Universals
Pantasote Top
Stromberg Carburetor
—and every other detail strictly high grade

Five-Passenger Touring.....$1550
Four-Passenger Model with five wire wheels 1695
Five-Passenger Sedan..... 2395

Columbia Motors Co.
DETROIT, U. S. A.

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Gasoline Automobiles—(Continued)

Brief Specifications, Prices and Names and Addresses of Manufactu ers

Model No. or Name	Manufacturer's Name and Address	No. of Cylinders Bore and Stroke of Motor	Make of Motor	N.A.C.C., H.P.	Wheel-base	Size of Tires
Nash 681	Nash Motors Co., Kenosha, Wis	6-3¼x5	Own	25.3	121	33x4
	Five-Passenger Touring $1490					
Nash 682	Nash Motors Co., Kenosha, Wis				127	34x4½
	Seven-Passenger Touring $1640					
Nash 683	Nash Motors Co., Kenosha, Wis				121	33x4
	Four-Passenger Roadster $1490					
Nash 684	Nash Motors Co., Kenosha, Wis				127	34x4½
	Six-Passenger Sedan $2250					
Nash 685	Nash Motors Co., Kenosha, Wis				127	34x4½
	Four-Passenger Coupe $2250					
National AF "Highway Six"	National Motor Car & Vehicle Corp., 1004 E. 22nd St., Indianapolis, Ind	6-3½x5¼	Continental	29.4	128	34x4½
	Chassis $2050					
	Four-Passenger Roadster 2450					
	Four-Passenger Phaeton 2450					
	Seven-Passenger Touring 2450					
	Seven-Passenger Touring Sedan 3120					
	Four-Passenger Coupe 2945					
National AK "Highway Twelve"	National Motor Car & Vehicle Corp., 1004 E. 22nd St., Indianapolis, Ind	12-2⅞x4¾	Own	39.6	128	34x4½
	Chassis $2650					
	Four-Passenger Roadster 3050					
	Four-Passenger Phaeton 3050					
	Seven-Passenger Touring 3050					
	Seven-Passenger Touring Sedan 3720					
	Four-Passenger Coupe 3545					
	Two-Passenger Speedster 3150					
Norwalk 18	Norwalk Motor Car Co., Martinsburg, W. Va	4-3½x5	Lycoming	19.6	110	32x3½
	Five-Passenger $1065					
Norwalk C	Norwalk Motor Car Co., Martinsburg, W. Va	6-4 x5½	Lycoming	38.4	136	39x5
	Two-Passenger $2750					
	Four-Passenger 2750					
	Six-Passenger 2750					
Norwalk D	Norwalk Motor Car Co., Martinsburg, W. Va	6-3⅞x5	Lycoming	36.0	131	37x4
	Two-Passenger $2250					
	Four-Passenger 2250					
Oakland 34-B	Oakland Motor Car Co., 240 Oakland Ave., Pontiac, Mich	6-2 11/16x4¾	Own	19.0	112	32x4
	Three-Passenger Roadster $1185					
	Five-Passenger Touring 1185					
	Coupe 1760					
	Sedan 1760					
Oldsmobile 37 See page 27	Olds Motor Works, Division St., Lansing, Mich	6-2 11/16x4¾	Northway	18.9	112	32x4
	Five-Passenger $1395					
	Two-Passenger 1395					
Oldsmobile 45-A	Olds Motor Works, Division St., Lansing, Mich	8-2⅞x4¾	Own	26.4	120	34x4
	Seven-Passenger $1700					
	Two-Passenger 1700					
	Four-Passenger Sportster 1700					
Overland 90 See page 29	Willys-Overland, Inc., Toledo, Ohio	4-3⅜x5	Own	18.2	106	31x4
	Touring $1095					
	Roadster 1095				104	
	Country Club 1145				106	
	Sedan 1665				106	
Overland 85-4	Willys-Overland, Inc., Toledo, Ohio	4-4⅛x4½	Own	27.2	112	32x4
	Touring $1175					
	Roadster					
Overland 85-6	Willys-Overland, Inc., Toledo, Ohio	6-3¼x4½	Continental	25.3	116	32x4
	Touring Car $1495					
	Roadster 1495					
	Touring Coupe 1750					
	Touring Sedan 1920					
Owen Magnetic See page 29	Baker R. & L. Co., Cleveland, Ohio	6-4 x5½	Own	38.4	142	35x5
	Seven-Passenger Touring $5500					
	Seven-Passenger Sedan 6500					
	Seven-Passenger Limousine 6500					

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Write today for agency.

WE need a few more good wide-awake distributors for the "Bell Car"—it is a car that almost sells itself, owing to its high standard of construction, embodying as it does the same general principle as contained in cars selling for $2,000 to $3,000.

Write us today for our facts about the "Bell" and our proposition to distributors.

Bell Motor Car Co.
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The biggest motor car value on the market in its price class.

118-inch Wheelbase
Valve-in-head Motor
35 Horsepower
33x4 Tires

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Motor Vehicle Factor

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Factory Representative for
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Designed by Ray Harroun and built under his direction.

The lightest completely equipped car of popular price.

A valve-in-the-head motor of remarkable power and efficiency.

A quality of finish and upholstery equalled only by cars of greatly higher price.

The roomiest five-passenger car we know.

In good looks and in performance this Harroun car will make good every detail of a sales story the most interesting and convincing any dealer has at his command.

OUR DISTRIBUTOR CONTRACTS ARE FOR FIVE YEARS

HARROUN MOTORS CORPORATION
Factory & General Offices:
Wayne, Michigan

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Gasoline Automobiles—(Continued)

Brief Specifications, Prices and Names and Addresses of Manufacturers

Model No. or Name	Manufacturer's Name and Address	No. of Cylinders Bore and Stroke of Motor	Make of Motor	N.A.C.C., H.P.	Wheel-base	Size of Tires
Packard 3-25	Packard Motor Car Co., E. Grand Blvd. & Belt Line, Detroit, Mich. Chassis $4300 Seven-Passenger Standard Touring 4800 Seven-Passenger Salon Touring 4800 Five-Passenger Phaeton 4800 Five-Passenger Salon Phaeton 4800 Four-Passenger Runabout 4800 Seven-Passenger Limousine 6350 Seven-Passenger Landaulet 6400 Four-Passenger Coupe 6150 Seven-Passenger Brougham 6500	12-3 x5	Own	43.2	128	35x5
Packard 3-35	Packard Motor Car Co., E. Grand Blvd. Belt Line, Detroit, Mich. Chassis $4550 Seven-Passenger Standard Touring 5150 Seven-Passenger Salon Touring 5150 Seven-Passenger Limousine 6700 Seven-Passenger Landaulet 6750	12-3 x5	Own	43.2	136	35x5
Paige 6-39	Paige-Detroit Motor Car Co., Fort and McKinstry Sts., Detroit, Mich. Five-Passenger Linwood $1515 Three-Passenger Glendale 1515 Three-Passenger Cabriolet 1810	6-3⅛x5	Rutenber	23.4	117	32x4
Paige 6-55	Paige-Detroit Motor Car Co., Fort and McKinstry Sts., Detroit, Mich. Four-Passenger Larchmont $2090 Seven-Passenger Essex 2090 Seven-Passenger Sedan 2950 Four-Passenger Coupe 2950 Seven-Passenger Town Car 3300 Seven-Passenger Limousine 3300	6-3½x5¼	Continental	29.4	127	33x4½ 35x4½
Pan 1919	Pan Motor Co., St. Cloud, Minn. Five-Passenger Touring Five-Passenger Sedan Three-Passenger Roadster	4-3¼x5	Own	16.9	108	33x4
Pan 250	Pan Motor Co., St. Cloud, Minn. Five-Passenger Touring $1250	4-3½x5	Continenta	19.6	116	34x4
Pan-American G **See page 27**	**Pan-American Motors Corp. Decatur, Ill.** **Five-Passenger Touring $1800** **Two-Passenger Roadster 1800**	**6-3⅛x5**	**Rutenber**	**23.4**	**121**	**37x4½**
Paterson 6-46 **See page 21**	**Paterson Co., W. A., Flint, Mich.** **Price $1595**	**6-3¼x4½**	**Continental**	**25.3**	**120**	**33x4**
Peerless 56	Peerless Motor Car Co., Quincy Ave. and S. E. 93rd St., Cleveland, Ohio. Four-Passenger Roadster 2550 Seven-Passenger Touring 2550 Coupe 3050 Sedan 3250 Limousine 3690	8-3¼x5	Own	33.8	125	35x4½
Piedmont N30	Piedmont Motor Car Co., Lynchburg, Va. Club Roadster $995 Five-Passenger Roadster 995 Two-Passenger Roadster 995	4-3½x5¼	Lycoming	19.6	116	32x3½
Piedmont N40	Piedmont Motor Car Co., Lynchburg, Va. Club $1465 Five-Passenger 1465 Two-Passenger 1465	6-3¼x5	Continental	25.3	120	32x4

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The Cole Aero-EIGHT

7 Passenger Tourster ...	$2595
4 Passenger Sportster ...	2595
2 Passenger Roadster ...	2595
7 Passenger Toursedan ..	3695
4 Passenger Tourcoupé ..	3795
Towncar ...	3795

All prices f.o.b. factory. Subject to change without notice.

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Oldsmobile

Sets the Pace

21st Year

Your demand for real utility with economy, ease and speed—whether you prefer an eight or a six—is best supplied in the Oldsmobile.

A handsome car, a real performer and at a moderate price.

See your Oldsmobile dealer.

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Lansing, Mich.

The Pan-American

The car with the white radiator is a durable car. The best engineering skill in the automobile world has been incorporated in every part, each individual part being the recognized highest standard make on the market today. Rutenber, Timken, Rayfield, Stewart-Warner, Gray & Davis, Willard, Firestone are to the automobile what Uncle Sam's signature is to a Treasury note.

Wheel Base 120"

Price $1,800

F. O. B. Factory

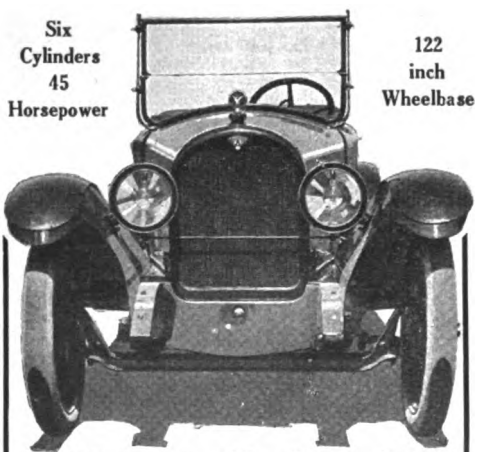
Pan-American Motors Corporation

Factory & Executive Offices

Decatur Ill.

Six Cylinders 45 Horsepower

122 inch Wheelbase



AMERICAN "The Balanced Six"

Standard units—each the recognized leader in its field—are co-ordinated in the new AMERICAN SIX to form a perfect and complete piece of engineering. The whole weight of the car is evenly distributed throughout—equally over the four wheels—to the fraction of a pound. This *scientific balance* means:

Unequalled Roadability, Low Driving Costs, Low Upkeep Costs, Economy and Security.

Write for catalog.

AMERICAN MOTORS CORP.

LOUIS CHEVROLET, Vice-President and Chief Engineer

PLAINFIELD, NEW JERSEY

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Gasoline Automobiles—(Continued)

Brief Specifications, Prices and Names and Addresses of Manufacturers

Model No. or Name	Manufacturer's Name and Address	No. of Cylinders Bore and Stroke of Motor	Make of Motor	N.A.C.C., H.P.	Wheel-base	Size of Tires
Pierce-Arrow C-4	Pierce-Arrow Motor Car Co., Buffalo, N. Y. Price.....$4800	6-4 x5½	Own	38.4	134	34x4½
Pierce-Arrow B-4	Pierce-Arrow Motor Car Co., Buffalo, N. Y. Price.....$5500	6-4½x5½	Own	48.6	142	35x5
Pierce-Arrow A-4	Pierce-Arrow Motor Car Co., Buffalo, N. Y. Price.....$6500	6-5 x7	Own	60.0	147½	36x5
Pilot 6-45	Pilot Motor Car Co., 281 Fort Wayne Ave., Richmond, Ind. Touring.....$1495 Roadster.....1545 Sedan.....2145	6-3⅛x5	Teetor-Hartley	23.4	120	32x4
Premier 6-C **See page 23**	**Premier Motor Corp., Indianapolis, Ind.** **Touring.....$2585** **Foresome.....2585** **Sedan.....3585**	6-3⅜x5½	Own	27.3	125½	35x4½
Reo T	Reo Motor Car Co., Lansing, Mich. Price.....$1225	4-4⅛x4½	Own	27.2	120	34x4
Reo M	Reo Motor Car Co., Lansing, Mich. Price.....$1550	6-4 3/16x5⅛	Own	30.4	128	34x4½
ReVere A **See page 17** **ReVere B** **ReVere C**	**ReVere Motor Car Corp., Chicago, Ill** **Seven-Passenger.....$3850** **Four-Passenger.....3850** **Two-Passenger.....3500**	4-4⅜x6	**Duesenberg**	**30.6**	**131**	**32x4½** ....
Roamer D 4-75	Barley Motor Car Co., Kalamazoo, Mich. Four-Passenger.....$3250 Four-Passenger Sport.....2575 Four-Passenger Touring.....2475	4-4 x6 6-3½x5¼	Duesenberg Continental	25.6 29.4	128 128	32x4½ 32x4 32x4½
Roamer 6-54	Barley Motor Car Co., Kalamazoo, Mich. Seven-Passenger Touring.....2650 Touring Sedan.....3350 Standard Sedan.....3350 Town Car.....3350 Coupe.....3350 Limousine.....3350	6-3½x5¼	Continental	29.4	128	32x4
Roamer 6-90	Barley Motor Car Co., Kalamazoo, Mich. Six-Passenger Touring.....$3350 Seven-Passenger Touring.....3450	6-4 x5½	Herschell-Spill.	38.4	138	34x4½
Rock Falls 10 **See page 203**	**Rock Falls Mfg. Co., Sterling, Ill.** **Four-Passenger Roadster.....$3500**	8-3¼x5	**Herschell-Spill.**	33.8	132	35x5
	Root & VanDervoort.—See Moline-Knight.					
Saxon Y 18 T	Saxon Motor Car Co., Beaufort and Waterloo Aves., Detroit, Mich. Touring.....$1195	6-2⅞x4½	Continental	19.8	112	32x3½
Saxon Y 18 R	Saxon Motor Car Co., Beaufort and Waterloo Aves., Detroit, Mich. Chummy Roadster.....$1195	.....	.....	.....	.....	.....
Sayers & Scoville A	Sayers & Scoville Co., Gest St. and B. & O. R. R., Cincinnati, O. Five-Passenger Touring.....$1495	6-3¼x4½	Continental	25.3	118	32x4
Scripps-Booth Six-39 **40-41-42** **See page 21**	**Scripps-Booth Corp., Detroit, Mich.** **Five-Passenger Touring.....$1385** **Three-Passenger Roadster.....1385** **Five-Passenger Sedan.....1985** **Four-Passenger Coupe.....1985**	6-2 11/16x4¾	**Northway**	**19.0**	**112**	**32x4**
Scripps-Booth G	**Scripps-Booth Corp., Detroit, Mich.** **Three-Passenger Roadster.....$1065**	4-3 11/16x4	**Mason**	**21.7**	**110**	**30x3½**
Scripps-Booth H	**Scripps-Booth Corp., Detroit, Mich.** **Four-Passenger Roadster.....$1285**	8-2⅝x3¾	**Ferro**	**22.0**	**120**	**32x4**
Seneca D **See page 51**	**Seneca Motor Car Co. Fostoria Ohio** **Five-Passenger.....$925**	4-3⅛x4½	**LeRoi**	**15.6**	**108**	**30x3½**
Seneca E	**Seneca Motor Car Co. Fostoria, Ohio** **Four-Passenger.....$975**	4-3½x4½	**LeRoi**	**19.6**	**108**	**30x3½**

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Back of the Lexington car, affiliated with it and contributing to it, are ten large factories.

Lexington Motor Company, Mfrs.
CONNERSVILLE, IND., U. S. A.

Overland
The Thrift Car

Willys Knight
Sleeve-Valve Motor

Improves with Use

Willys-Overland, Inc.
Toledo, Ohio

Willys-Knight and Overland Motor Cars and Light Commercial Cars

Important Features of the

RAUCH & LANG ELECTRIC

Motor—Rauch & Lang Hertner type—designed and built in our own factory.

Drive—Direct from motor to propeller shaft, thence through top mounted straight type worm gear to rear axle. The worm gear drive is silent, requires no adjustment and increases in efficiency with use.

Tires—33" x 4½".

Axles—Front tubular. Rear ¾ floating type.

Springs—Front semi-elliptic. Rear ⅞ elliptic. This spring design eliminates side-swaying motion and is remarkably flexible. Wheel base—92" in the Brougham; 120" in the coach—the tread is standard. Complete illustrated catalog sent upon request.

B R & L INDUSTRIAL Tractors and Trucks

The Baker R & L System of Industrial Transportation replaces man power and performs a haulage service of merit.

The system can be adapted to every industry. Each need can be met the Baker way and worked out 100% efficient.

The Baker R & L machines consisting of tractors and trucks for inter-departmental haulage mean to the industry—minimum man power, multiplied haulage, freedom from congestion, utmost flexibility, lower cost per ton hauled.

For twenty years The Baker R & L Company has specialized in battery-driven vehicles. Inter-standardization, a Baker R & L feature, is a direct result of this experience and leadership.

The line consists of Tractors, Utility, Low Platform, and Elevating Trucks and adaptable to every industry.

Literature upon request.

Rauch & Lang Electrics "The Social Necessity"

THE BAKER R & L COMPANY
CLEVELAND

BRC

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Gasoline Automobiles—(Continued)

Brief Specifications, Prices and Names and Addresses of Manufacturers

Model No. or Name	Manufacturer's Name and Address	No. of Cylinders Bore and Stroke of Motor	Make of Motor	N.A.C.C., H.P.	Wheel-base	Size of Tires
Standard G **See page 19**	**Standard Steel Car Co., Frick Bldg., Pittsburgh, Pa.**	**8-3¼x5**	**Herschell-Spill.**	**33.8**	**127**	**34x4½**
	Chassis **$2250**					
	Seven-Passenger Touring **2450**					
	Four-Passenger Roadster **2450**					
	Two-Passenger Roadster **2450**					
	Four-Passenger Coupe **3500**					
	Seven-Passenger Sedan **3500**					
	Seven-Passenger Limousine **4000**					
States B-18	States Motor Car Co., Kalamazoo, Mich.	4-3¾x4¼	G. B. & S.	22.5	112	32x3½
	Sedan $1495					
	Touring 1025					
	Roadster 1025					
Stearns SKL4	Stearns Co., F. B., Cleveland, Ohio	4-3¾x5⅝	Own	22.5	119	34x4
	Chassis $1800					
	Four-Passenger 1935					
	Five-Passenger 1935					
	Coupe 2500					
	Limousine 3350					
	Limousine Brougham 3400					
	Landaulet 3300					
	Landaulet Brougham 3350					
	Sedan 2635					
	Seven-Passenger 2300	.....	.....	.....	.....	35x4½
	Model Militaire 2500					
Stearns SK8	Stearns Co., F. B., Cleveland, Ohio	8-3¼x5	Own	33.8	125	35x4½
	Chassis $2300					
	Four-Passenger 2700					
	Seven-Passenger 2700					
	Coupe 3200					
	Coupe Landaulet 3200					
	Limousine 3875					
	Limousine Brougham 3875					
	Model Militaire 2850					
	Landaulet 3985					
	Landaulet Brougham 3985					
Stephens Salient Six 7. **See page 21**	**Stephens Motor Branch of Moline Plow Co., Moline, Ill.**	**6-3¼x4½**	**Own**	**25.3**	**118**	**32x4**
	Three-Passenger **$1675**					
	Four-Passenger **1725**					
	Five-Passenger **1675**					
	Four-Passenger Victoria **1975**					
	Five-Passenger Sedan ..... **....**					**33x4½**
	Six-Passenger **1850**					
Studebaker SH4	Studebaker Corp. of America, Bronson and Main Sts., South Bend, Ind.	4-3½x5	Own	19.6	112	32x3½
	Touring $1125					
	Sedan 1685					
Studebaker EG6	Studebaker Corp. of America, Bronson and Main Sts., South Bend, Ind.	6-3⅞x5	Own	36.0	126	33x4½
	Touring $1985					
Studebaker EH6	Studebaker Corp. of America, Bronson and Main Sts., South Bend, Ind.	6-3½x5	Own	29.4	119	32x4
	Touring $1585					
	Club Roadster 1585					
	Sedan 2185					
Stutz	Stutz Motor Car Co. of America, Tenth St. and N. Capitol Ave., Indianapolis, Ind.	4-4⅜x6	Own	30.6	130	32x4½
	Four-Passenger $2650					
	Six-Passenger 2750					
	Seven-Passenger 2750					
	Bearcat 2550					
Templar A-445	Templars Motor Corp., Cleveland, Ohio	4-3⅜x5½	Own	18.2	118	32x4
	Chassis $1850					
	Four-Passenger Touring $2085					
	Five-Passenger Touring 2085					
	Four-Passenger Victoria 2285					
	Two-Passenger Roadster 2385					
Velie 38	Velie Motors Corp., Third Ave. and Third St., Moline, Ill.	6-3¼x4½	Continental	25.4	115	32x4
	Five-Passenger Touring $1540					
	Four-Passenger Roadster 1540					
	Two-Passenger Roadster 1540					
	Three-Passenger Cabriolet 2000					
	Four-Passenger Coupe 2100					
	Five-Passenger Sedan 2100					
	Five-Passenger Town Car 2500					

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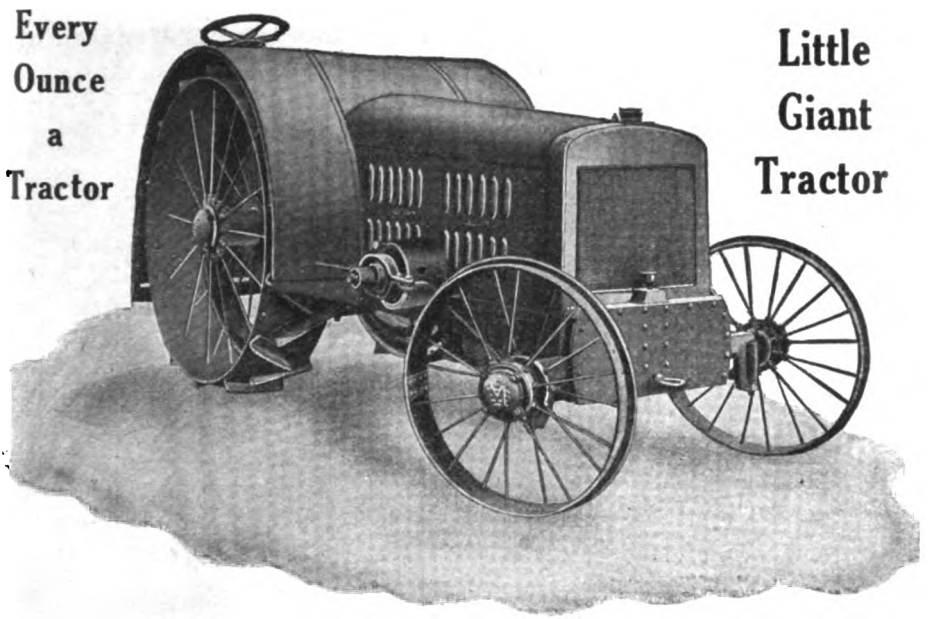

LITTLE GIANT TRACTORS are made in two sizes, viz.: Model "B" 16-22 H.P. and Model "A" 26-35 H.P.

They have three forward speeds, viz.: 1½, 3 and 6 miles per hour, and one reverse speed of 1½ miles per hour.

They are entirely enclosed from weather, and all gearing, etc., are enclosed from dust, dirt or other damaging elements.

They are spring mounted on three point suspension, and it is impossible to strain or rack the main frame or any mechanism.

All gears, shafting or other working parts are of alloy steel, heat treated and surface hardened.

Seventeen set Hyatt Roller Bearings and numerous ball bearings reduce friction to a minimum and there are no plain bearings used.

A unit power plant, consisting of belt pulley drive, motor, clutch, transmission and differential, short coupled and straight driven, without universal joints, running entirely in a body of oil and on roller and ball bearings, delivers 76% of our motor power to the draw bar, as compared with 40 to 50% with other tractors.

Steering gear is of the worm and gear irreversible type—no jerking of drivers' arms, and a child can handle it easily.

LITTLE GIANT TRACTORS use kerosene without smoke or smell, and at half the cost of gasoline. They will also use gasoline, distillate or any other explosive fuel, excepting crude oil, with much greater economy than any other motor made.

Motors and everything else, excepting a few accessories, are built in our factory from raw material to finished product.

Tractors will be the next big selling proposition, and bid fair to surpass even the present volume of automobile sales.

Mr. Automobile Dealer: Will you get in the tractor game now and be on the ground floor, or will you wait until the tens of thousands of automobile dealers in North America have secured all of the good tractor selling territory.

The Ford automobile agency is fought for to-day. A few years ago it went begging in many good territories. Its history will be repeated with the LITTLE GIANT TRACTOR.

You can NOT afford to sell your customer a tractor that you would not buy yourself. Profits will be made from repeat neighborhood orders by reason of satisfied tractor users. You cannot expect to make much money the first year.

The LITTLE GIANT TRACTOR is what you have been waiting for. It has made good during the past seven years that we have manufactured and sold it.

We have been in business in our present location since January, 1876—nearly 42 years—your banker can tell you about our responsibility—assuring satisfactory repair service, etc.

LITTLE GIANT COMPANY

Established A. D. 1876

199 Rock Street, Mankato, Minn., U. S. A.

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Gasoline Automobiles—(Continued)

Brief Specifications, Prices and Names and Addresses of Manufacturers

Model No. or Name	Manufacturer's Name and Address	No. of Cylinders Bore and Stroke of Motor	Make of Motor	N.A.C.C., H.P.	Wheel-base	Size of Tires
Velie 39	Velie Motors Corp., Third Ave. and Third St., Moline, Ill.	6-4½x5¼	Continental	29.6	124	33x4½
	Four-Passenger Sport $2050					
Westcott 18	Westcott Motor Car Co., Warder and Spring Sts., Springfield, Ohio	6-3½x5¼	Continental	29.4	125	32x4½
	Four-Passenger Roadster $2090					
	Seven-Passenger Touring 2490					
	Four-Passenger Coupe 3090					
	Five-Passenger Sedan 3090					
	Seven-Passenger Sedan 3090					
White GM	White Co., 842 E. 79th St., Cleveland, Ohio	4-4¼x5¾	Own	28.9	157½	35x5
	Chassis $3900					
	Seven-Passenger Touring 5000					
	Seven-Passenger Limousine 6200					
	Seven-Passenger Landaulet 6200					
	Seven-Passenger Cabriolet 6400					
White GMT	White Co., 842 E. 79th St., Cleveland, Ohio	4-4¼x5¾	Own	28.9	124½	35x5
	Chassis $3850					
	Four-Passenger Roadster 5000					
	Six-Passenger Town Car 6050					
	Six-Passenger Landaulet 6050					
	Four-Passenger Sedan 6050					
Willys-Knight 4 **See page 29**	**Willys-Overland, Inc., Toledo, Ohio** **(See Overland; also Willys-Knight; also Willys.)**	4-4⅛x4½	Own	27.2	121	34x4½
	Touring Car $1925					
	Coupe 2850					
Willys-Knight 8	**Willys-Overland Inc., Toledo, Ohio**	8-3⅜x4	Own	36.4	125	34x4½
	Touring Car $2750					
	Touring Sedan 3475					
	Limousine 3500					
	Coupe 3425					
Willys 89-6	**Willys-Overland, Inc., Toledo, Ohio**	6-3½x5¼	Continental	29.4	120	33x4½
	Touring Car $1775					
	Club Six 1775					
Winton 22A	Winton Co., 10601 Berea Rd., Cleveland, Ohio	6-3¾x5¼	Own	33.7	128	36x5
	Two-Passenger Roadster $3150					
	Four-Passenger Touring 3150					
	Five-Passenger Touring 3150					
	Six-Passenger Touring 3200					
	Seven-Passenger Touring 3200					
	Three-Quarter Limousine 4150					
	Four Door Limousine 4400					
Winton 22	Winton Co., 10601 Berea Rd., Cleveland, Ohio	6-4½x5½	Own	48.6	138	35x5
	Two-Passenger Roadster $3850					
	Four-Passenger Touring 3850					
	Five-Passenger Touring 3850					
	Six-Passenger Touring 3850					
	Seven-Passenger Touring 3850					
	Three-Quarter Limousine 4850					
	Four Door Limousine 5100					

Electric Automobiles

Brief Specifications, Prices and Names and Addresses of Manufacturers

Model No. or Name	Manufacturer's Name and Address	Make of Battery	Wheel-base	Size of Tires
Anderson	See Detroit.			
	Baker R. & L. Co.—See R & L.			
Detroit 71-72-73-74	Anderson Electric Car Co., Riopelle St. and Clay Ave., Detroit, Mich.	Detroit	100	34x4½
	Four-Passenger Brougham, Rear Drive $2940			
	Five-Passenger Brougham, Front Drive 3015			
	Five-Passenger Brougham, Rear Drive 2990			
	Five-Passenger Brougham, Duplex Drive			

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To Automotive Manufacturers

THE BRIEF SPECIFICATIONS in this Section are at the prompt disposal of all your points of distribution in the automobile trade.

You naturally desire to have these specifications correct.

Before each issue we will write you requesting changes.

Your prompt co-operation will be of benefit to all concerned.

To Automotive Dealers

IF these specifications lack anything to enable you to make a proper comparison of different models or makes of cars, a word from you as to what would best suit your needs will be appreciated.

This section was designed for your benefit —If it does not meet your requirements make your wants known.

The Automobile Trade Directory

ROBERT WOLFERS, President

243 West 39th Street New York

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Electric Automobiles—(Continued)

Brief Specifications, Prices and Names and Addresses of Manufacturers

Model No. or Name	Manufacturer's Name and Address	Make of Battery	Wheel-base	Size of Tires
Detroit 75-76	Anderson Electric Car Co., Riopelle St. and Clay Ave., Detroit, Mich. Four-Passenger Brougham, Rear Drive.....$2175 Three-Passenger Convertible Roadster..... 2175	Detroit	100	33x4½
Milburn 27	Milburn Wagon Co., 3134 Monroe St., Toledo, O. Five-Passenger Brougham	Philadelphia	105	32x4
Milburn 36	Milburn Wagon Co., 3134 Monroe St., Toledo, O. Limousine.....$2985 Sedan..... 2785 Roadster..... 2300	Philadelphia	120	34x4½
R & L C35 **See page 29**	**Baker R. & L., Co., Cleveland, Ohio** **Double Drive Coach.....$3500** **Single Drive..... 3400**	**Optional**	**102**	
R & L B36	**Baker R. & L., Co., Cleveland, Ohio** **Brougham.....$3250**	**Optional**	**92**	

Steam Automobiles

Brief Specifications, Prices and Names and Addresses of Manufacturers

Model No. or Name	Manufacturer's Name and Address	H.P.	Wheel-base	Size of Tires
Doble D	Doble-Detroit Steam Motors Co., 75 W. Congress St., Detroit, Mich. Seven-Passenger Touring.....$3750	75	135	35x5
Stanley 735	Stanley Motor Carriage Co., 44 Hunt St., Newton, Mass. Seven-Passenger Touring.....$3182	20	130	35x4½
Stanley 736	Stanley Motor Carriage Co., 44 Hunt St., Newton, Mass. Four-Passenger Touring.....$3132	20	130	35x5

Gasoline Commercial Vehicles

Brief Specifications, Prices and Names and Addresses of Manufacturers

Model No. or Name	Manufacturer's Name and Address	Load Capacity, Tons	No. of Cylinders, Bore and Stroke of Motor	Make of Motor	N.A.C.C. H.P.	Wheelbase	Size of Tires Front	Size of Tires Rear	Price
	Abbott-Downing.—See Concord.								
Acason	Acason Motor Truck Co., Detroit, Mich.								
	Model B	1½	4-3¾x5¼	Waukesha	22.5	150	36x3½	36x5	$2,500
	Model H	2	4-4¼x5½	Waukesha	28.9	150	36x4	36x7	2,850
	Model L	3½	4-4¼x6¾	Waukesha	28.9	172	36x5	36x5D	3,700
	Model M	5	4-4¾x6¾	Waukesha	36.1	172 187	36x6	40x6D	4,700
Acme **See page 53**	**Acme Motor Truck Co. 10 Mitchell St. Cadillac, Mich.**								
	Model B	**1**	**4-3¾x5**	**Continental**	**22.5**	**130**	**34x3**	**34x4**	**1,850**
	Model A	**2**	**4-4½x5¼**	**Continental**	**27.2**	**148**	**36x4**	**36x6**	**2,750**
	Model C	**3½**	**4-4½x5½**	**Continental**	**32.4**	**168**	**36x5**	**40x5D**	**3,650**
	Model D	**4**	**4-4½x5½**	**Continental**	**32.4**	**168**	**36x5**	**40x5D**	**4,050**
All-American **See page 57**	**All-American Truck Co., Sacramento Blvd., Chicago & Grand Aves., Chicago, Ill.**								
	Model A	**1**	**4-3¼x5**	**Herschell-Spill**	**16.9**	**138**	**33x4P**	**32x4**	**1,295**

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DEFIANCE

1½ Ton Trucks

DEFIANCE
Road H.P.

The Newest Thing in Trucks—Road-Horse-Power

Forty Road-Horse-Power makes the Defiance Truck easier to sell and to sell more of—

...aps you have not heard of ...ce Road-Horse-Power—

Defiance Road-Horse-Power is the ability to use every bit of power developed by the motor and make it work full force at the rear ...eels.

It is the result of successful engineering and consummate skill that converts full engine-power into driving power on the road.

That is exactly what truck buyers want.

Defiance Road-Horse-Power gives it to them.

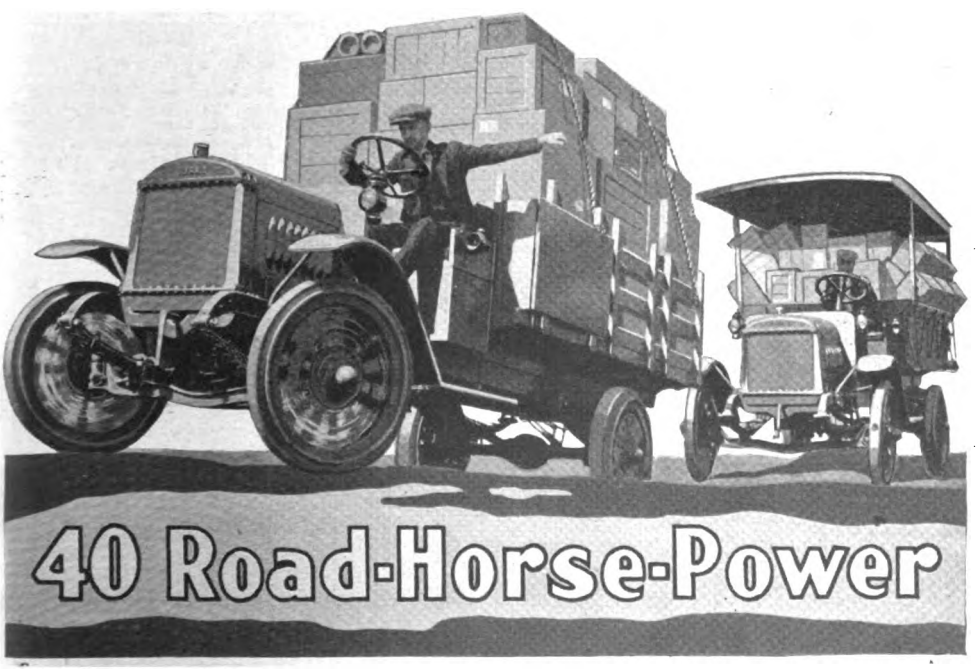
—Backed by a sales policy that gives an opportunity to make money selling a motor truck that will dominate your field.

Look over these specifications and you will know why.

Continental Red Seal Motor. Torbensen front axle and rear internal drive axle. Grant-Lees transmission. Arvac Universal Joints. Perfex Radiator. Borg and Beck Clutch.

Get in on this opportunity. Write to us today for our dealer proposition. $1795 f. o. b. Defiance.

The Turnbull Motor Truck and Wagon Co., Defiance, Ohio



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Gasoline Commercial Vehicles—(Continued)

Brief Specifications, Prices and Names and Addresses of Manufacturers

Model No. or Name	Manufacturer's Name and Address	Load Capacity, Tons	No. of Cylinders, Bore and Stroke of Motor	Make of Motor	N.A.C.C. H.P.	Wheelbase	Size of Tires Front	Size of Tires Rear	Price
Allfour	United Four Wheel Drive Truck Corp., 4649 W. Madison St., Chicago, Ill.								
	Model B	3	4-4 3/16x6		25.6	130	36x7	36x7	$1,500
All Power	All Power Truck Co., 1526 E. Jefferson Ave., Detroit, Mich.								
	Model A	3½	4-4½x5½	Continental	32.4	145	36x5	36x10	
American See page 45	**American Commercial Car Co., Detroit, Mich.—See also "Wolverine."**								
	Model	¾	4-3¾x4¼	**G. B. & S.**	**22.5**	**108**	**32x3½P**	**33x4P**	**1,180**
Armleder	Armleder Co., O. Cincinnati, Ohio.								
	Model H. W.	2	4-4⅛x5¼	Continental	27.2	148, 166	36x4	36x7, 36x4D	2,900
	Model K. W.	3½	4-4½x5½	Continental	32.4	156, 186	36x5	36x5D	3,850
Atlas See page 117	**Martin Truck & Body Corp., York, Pa.**								
	Model 18	¾	4-3½x5	**Lycoming**	**19.6**	**118**	**32x4P**	**32x4P**	**1,135**
Atterbury See page 12	**Atterbury Motor Car Co., Buffalo, N. Y.**								
	Model 7 R	1½	4-4⅛x5¼	**Continental**	**27.2**	**140¼**	**36x3½**	**36x5**	**2,475**
	Model 7 C	2	4-4⅛x5¼	**Continental**	**27.2**	**153½**	**36x4**	**36x4D**	**2,875**
	Model 7 D	3½	4-4½x5½	**Continental**	**32.4**	**167¼**	**36x5**	**40x5**	**3,775**
Autocar	Autocar Car, Ardmore, Pa.								
	Model 21-F	2	2-4¾x4½	Own	18.1	97	36x5P, 34x4	36x5P, 34x5	2,050
Available	Available Truck Co., 1539 N. Kilpatrick Ave, Chicago, Ill.								
	Model 1	1	4-3¾x5	Continental	22.5	132	36x3½	36x5	2,250
	Model 2	2	4-4⅛x5¼	Continental	27.2	150	36x4	36x7	2,950
	Model 3	3½	4-4½x5½	Continental	32.4	150	36x5	40x5D	4,200
	Model 5	5	4-4½x5½	Continental	32.4	168	36x6	40x6D	4,900
Beck	Beck-Hawkeye Motor Truck Works, 901-13 First Ave. W. Cedar Rapids, Iowa.								
	Model A	1	4-3½x5	Continental	19.6	124	34x3	34x4	1,350
	Model B	1½	4-3¾x5	Continental	22.5	144	34x3½	34x5	1,750
	Model C	2	4-4¼x5½	Continental	27.2	144	36x3½	36x6	2,150
Bell See page 25	**Bell Motor Car Co., York Pa**	¾	4-3¾x4¼	**G. B. & S**	**22.5**	**115**	**31x4P**	**31x4P**	**1,150**
Bessemer See page 55	**Bessemer Motor Truck Co., Grove City, Pa.**								
	Model H	1½	4-3¾x5	**Continental**	**22.5**	**144**	**36x3½**	**36x5**	**1,945**
	Model G	1	4-3½x5	**Continental**	**19.6**	**124**	**34x3½**	**34x4**	**1,495**
	Model J	2	4-4⅛x5¼	**Continental**	**27.2**	**158**	**36x4**	**36x4D**	**2,490**
	Model K	3½	4-4½x5½	**Continental**	**32.4**	**175**	**36x5**	**36x5D**	**3,450**
Bethlehem	Bethlehem Motor Corp., Allentown, Pa.								
	Model D-1	1½	4-3¾x4½	North American	22.5	136	34x3½	34x5	1,765
	Model E-1	2½	4-4 x4½	North American	25.6	144	34x4	34x6	2,165
	Model F-1	3½	4-4⅜x6	North American	30.6	162	34x4	34x5D	3,265
Bourne Magnetic	Bourne Magnetic Truck Co., New York City.								
	Model V. M.	2	4-4 x5½	Herschell-Spill	25.6	143	36x4	36x8	3,500
	Model X. M.	3½	4-4¼x5½	Herschell-Spill	29.0	160	36x5	36x10	4,200
	Bowling Green.—See Modern.								
Brinton	Brinton Motor Truck Co., 5740 Cherry St. Philadelphia, Pa.								
	Model H	1	4-3¼x5	Wisconsin	16.9	126	33x4½P	33x4½P	1,500
	Model F	2½	4-4⅛x5¼	Continental	27.2	138	36x4	36x6	2,800
Briscoe	Briscoe Motor Corp., Jackson, Mich.								
	Model 4-24	½	4-3 3/16x5⅛	Own	16.3	104	30x3½	30x3½P	885
	Model T. 24	1	4-3 3/16x5⅛	Own	16.3	132	31x4P	34x3½	1,000
Brockway	Brockway Motor Truck Co., 106 Railroad St., Cortland, N. Y.								
	Model J-2	1½	4-3¾x5	Continental	22.5	124, 140, 156	36x3½	36x5	
	Model K-3	2	4-4⅛x5¼	Continental	27.2	113, 148	36x4	36x7	
	Model R	3½	4-4½x5½	Continental	32.4	120, 164	36x5	36x5D	
	Camden Motors Corp.—See Frontmobile.								

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You will find the Lane Truck Dealer's Discount one of the most liberal in the truck field.

You will also find that the Lane Truck sells with unusual ease. Lane Dealers advise us this is due to the emphatic MECHANICAL LEADERSHIP of the Lane Truck.

Prospects readily realize that the Lane Truck is at least two years ahead in design and appointments. It leads in a *sales* way because it is a leader *mechanically*.

The Lane is the kind of truck the trade and the business public has been insistently demanding,—a *complete* truck. It is equipped with Electric Starting, Electric Lighting, Cab with curtains, windshield and regular chassis equipment.

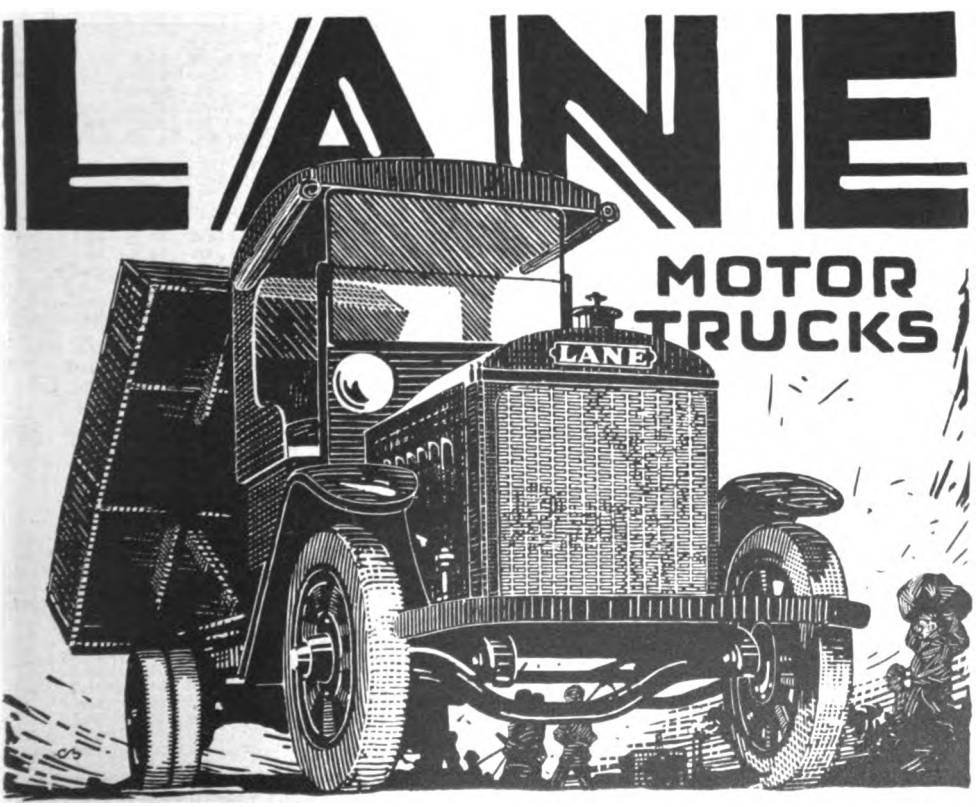
You can get as many Lane Trucks as you want, when you want them, for we obtain nearly all Lane Parts in our own city, or within easy truck hauling distance.

The Lane Truck is made of standard parts, carefully co-ordinated by some of the best motor truck engineers in this country. These parts are easily obtainable, and they are the best that money can buy, all the way from Continental Motor to Timken axles.

DEALERS: We are holding some very choice territory for a limited number of high class dealers. Write—or better, wire.

THE LANE MOTOR TRUCK CO., Kalamazoo, Mich., U. S. A.

Model F	Model B	Model C
3000 lbs. capacity—4 cyl.	5000 lbs. capacity—6 cyl.	7000 lbs. capacity
$1850	$2700	$3500



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Gasoline Commercial Vehicles—(Continued)

Brief Specifications, Prices and Names and Addresses of Manufacturers

Model No. or Name	Manufacturer's Name and Address	Load Capacity, Tons	No. of Cylinders, Bore and Stroke of Motor	Make of Motor	N.A.C.C. H.P.	Wheelbase	Size of Tires Front	Size of Tires Rear	Price
Chase	Chase Motor Truck Co., 332 S. West St., Syracuse, N. Y.								
	Model A	1	4-3½x5¼	Waukesha	19.6	138	36x3½	36x5	$1,725
	Model C	1½	4-3½x5¼	Waukesha	19.6	149	36x3½	36x6	2,025
	Model B	2½	4-4⅛x5½	Buda	27.2	160	36x4	36x4D	2,475
	Model X	3	4-4⅛x5½	Buda	27.2	160	36x4	36x5D	2,800
	Model O	3½	4-4½x5½	Continental	32.4	175	36x5	36x5D	3,600
Chevrolet	Chevrolet Co. of New York, 1764 Broadway, New York City.								
	Model	1	4-3 11/16x5¼	Own	21.7	125	31x4P	32x4P	1,125
	Chicago Pneumatic Tool Co.—See Giant.								
Clydesdale	Clyde Cars Co., Clyde, Ohio.								
	Model 45	1½	4-4⅛x5¼	Continental	27.3	146	36x3½	36x5	
	Model 65	2	4-4⅛x5¼	Continental	27.3	163, 180	36x4	36x4 D	
	Model 90	3½	4-4½x5½	Continental	32.4	180, 170	36x5	36x5 D	
	Model 120	5	4-4¾x6	Continental	36.1	180, 190	36x6	40x6D	
Collier See page 55	**Collier Motor Truck Co., Bellevue Ohio.**								
	Model M	¾	4-3½x5	Lycoming	19.6	118	32x4P	32x4P	985
Columbia See page 51	**Columbia Motor Truck & Trailer Co., Pontiac, Mich.**								
	Model E	2	4-4⅛x5¼	Continental	27.2	134, 144, 164	36x4	36x6	2,275
Comet	Comet Automobile Co. 156 S. Water St. Decatur Ill. Model 1-T-2	1¼	4-3½x5	Lycoming	....	130	34x4	34x4	1,565
Commerce	Commerce Motor Car Co., 26 Mackie St., Detroit, Mich.		4-3¾x5						
	Model E	1		Continental	22.5	126	34x3	34x4	1,450
Concord	Abbot-Downing, Concord, N. H.		4-3¾x5½						
	Model A	1½	4-4¼x5½	Buda	22.5	140	36x3½	36x5	2,250
	Model B	2½		Buda	28.9	150	36x4	36x4D	2,750
Conestoga (See page 57.)	**First National Sales Corp., Lancaster, Pa. (Sole Distributors for Conestoga Motor Truck Co., Lancaster, Pa.)**								
Corbitt	Corbitt Motor Truck Co., Henderson, N.C.								
	Model E	1	4-3¾x5	Continental	22.5	130	34x3½	34x4	2,000
	Model D	1½	4-3¾x5	Continental	22.5	138	36x3½	36x5	2,400
	Model C	2	4-4⅛x5¼	Continental	27.2	148	36x4	36x3½	D3,000
	Model B	2½	4-4⅛x5¼	Continental	27.2	148	36x4	36x4D	3,200
	Model A	3½	4-4½x5½	Continental	32.4	168	36x5	36x5D	4,000
	Model A-A	5	4-4½x5½	Continental	32.4	168	36x6	36x6	4,500
Corliss See page 39	**Corliss Motor Truck Co., Corliss, Wis.**								
	Model A	½	2-3⅛x4½	.....	15.6	100	31x4P	31x4P	800
Couple-Gear	Couple-Gear Freight-Wheel Co., 1450 Buchanan St., Grand Rapids, Mich.								
	Model H. C	3½	4-5 1/16x5½	Wisconsin	41.6	144	36x4 D	36x4D	6,000
	Model A. C	5	4-5¼x7	Wisconsin	44.1	144	36x5 D	36x5D	6,000
	Model L. D	7	4-5¼x7	Wisconsin	44.1	144	36x5 D	36x6	7,200
Crawford	Crawford Automobile Co., Surrey and Summit Aves., Hagerstown, Md.								
	Model	2	6-3½x5¼	Continental	29.4	144	34x4	34x6	2,450
Dart	Dart Truck & Tractor Corp., Waterloo. Iowa.								
	Model E	1	4-3¾x5	Continental	22.5	130	34x3	34x5	1,900
	Model C C-4	2	4-4¼x5½	Buda	28.9	150	36x4	36x7	2,750
	Model L	3½	4-4½x6	Buda	32.4	160	36x5	36x10	3,800
D-E See page 57	**Day-Elder Motors Corp., Newark, N.J.**								
	Model J	¾	4-3⅛x5	LeRoi	15.6	108	32x4P	33x4P	1,045
	Model A	1	4-3½x5	Continental	19.6	128	34x3	34x4	1,775
	Model B	1½	4-3¾x5	Continental	22.5	144	34x3½	34x5	2,075
	Model D	2	4-3¾x5	Continental	22.5	128	34x4	34x6	2,150
	Model C	2½	4-4¼x5½	Buda	28.9	150	36x4	36x7	2,750
	Model E	5	4-4½x6	Buda	32.4	165, 150, 170	36x5	40x6D	4,500

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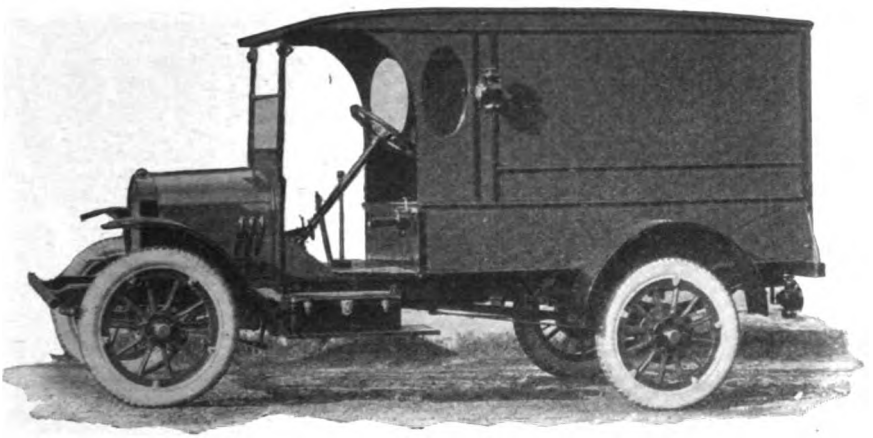
Corliss Truck



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Le Roi Motor—Covert Transmission
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Gasoline Commercial Vehicles—(Continued)

Brief Specifications, Prices and Names and Addresses of Manufacturers

Model No. or Name	Manufacturer's Name and Address	Load Capacity, Tons	No. of Cylinders, Bore and Stroke of Motor	Make of Motor	N.A.C.C. H.P.	Wheelbase	Size of Tires Front	Size of Tires Rear	Price
Denby	Denby Motor Truck Co., Holbrook Ave. and G. T. R. R., Detroit, Mich.								
	Model 12	1	4-3½x5	Continental	19.6	124	34x3	34x4	$1,650
	Model 13	2	4-3¾x5	Continental	22.5	144	36x3½	36x6	2,300
	Model 15	3	4-3¾x5	Continental	22.5	144	36x4	36x4D	2,775
	Model 210	5	4-4½x5½	Continental	32.4	170	36x6	40x12	4,900
Defiance **See page 35**	**Turnbull Motor Truck & Wagon Co., Defiance, Ohio.**								
	Model B	**1½**	**4-3¾x5**	**Continental**	**22.5**	**135**	**34x3½**	**34x5**	**1,795**
Diamond T	Diamond T. Motor Car Co., 4517 W. 26th St., Chicago, Ill.								
	Model J-5	1	4-3½x5	Continental	19.6	132	36x3	36x4	2,125
	Model J-4	1½	4-3¾x5	Continental	22.5	154 160	36x3½	36x5	2,550
	Model J-3	2	4-4⅛x5¼	Continental	27.2	154 160	36x4	36x6	2,925
	Model L B	3½	4-4½x5½	Continental	32.4	170 180	36x5	36x6D	4,150
	Model R	5	4-4½x5½	Continental	32.4	170	36x6	40x6D	4,950
Dispatch	Dispatch Motor Car Co., 1200-14th Ave., S. E., Minneapolis, Minn.								
	Model G	1	4-3¾x5	Wisconsin	22.5	120	34x4P	34x4P	1,200
Doane	Doane Motor Truck Co., San Francisco, Cal.								
	Model	2½	4-4¼x5¾	Waukesha	28.9	156	36x4	36x7	3,500
	Model	6	4-4¾x6¾	Waukesha	36.1	178	36x6	40x6D	5,350
Dodge	Dodge Bros., 1678-1724 Jos. Campau Ave., Detroit, Mich.								
	Model	½	4-3⅞x4½	Own	24.0	114	33x4P	33x4P	985
Dorris	Dorris Motor Car Co., 4100 Laclede Ave., St. Louis, Mo.								
	Model K-4	2	4-4¼x5½	Own	28.9	144 162	36x4	36x7	2,985
Double Drive B	Double Drive Truck Co., 4826-32 W. Kinzie St., Chicago, Ill.								
	Model	3	4-4⅛x5½	Rutenber	27.2	124	36x6	36x6	2,500
Douglas	Douglas Motors Corp., 30th and Spruce Sts., Omaha, Neb.								
	Model	1½	4-4¼x5½	Buda	28.9	126	34x3½	34x5	2,000
	Double Drive Truck Co.—See F.W.D.								
Duplex	Duplex Truck Co., Lansing, Mich.								
	Model E	3½	4-4¼x5½	Buda	28.9	130	36x6	36x6	4,000
Durable	Durable Motor Truck Co., 650 Hohman St., Hammond, Ind.								
	Model B	1½	4-3½x5	Continental	19.6	126	34x4	34x5	2,040
F. W. D.	Double Drive Truck Co., 4826-32 W. Kinzie Ave., Chicago, Ill.								
	Model C	1½	6-3⅛x5	Rutenber	23.4	124	36x4	36x4	2,500
Fageol	Fageol Motors Co., 107th Ave. and Hollywood Blvd., Oakland, Cal.								
	Model	2	4-4¼x5¾	Waukesha	28.9	144	34x4	36x4	3,300
	Model	2½	4-4¼x5¾	Waukesha	28.9	144	34x4	36x4	3,300
	Model	3½	4-4¾x6¾	Waukesha	36.1	144 172 190	36x5	36x5D	4,250
	Model	4	4-4¾x6¾	Waukesha	36.1	144 172 190	36x5	36x5D	4,250
	Model	5	4-4¾x6¾	Waukesha	36.1	144 172 190	36x6	40x6D	5,100
	Model	6	4-4¾x6¾	Waukesha	36.1	144 172 190	36x6	40x6D	5,100
Fargo	Fargo Motor Car Co., 1164-66 W. 22d St., Chicago, Ill.								
	Model P	2	4-3¾x5	Continental	22.5	144	36x4	36x6	2,200

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Gary Trucks

are built for hard, continuous service

With a hundred or more motor trucks to choose from, the dealer today is puzzled to know just which one to handle.

Gary Trucks solve that problem by first offering the dealer a complete line from 1 to 3½—a line that meets 90% of all business needs.

Second—Gary Trucks are built for hard service—they are big—strong and massive.

The motor is the best that engineering science has produced to date. The rear axle is the worm-drive, which is efficient and silent.

With this type of axle it is possible to secure 94% to 97% power efficiency and an average of 80,000 miles of continuous service.

These are all very important and vital matters for every dealer to know before taking on a line of motor trucks.

We would like to tell you the full story of Gary Worm-Drive Trucks—how they are constructed—why they are winning out, while other trucks are failing—and, lastly, why you should become a Gary dealer. Let us hear from you today.

SPECIFICATIONS

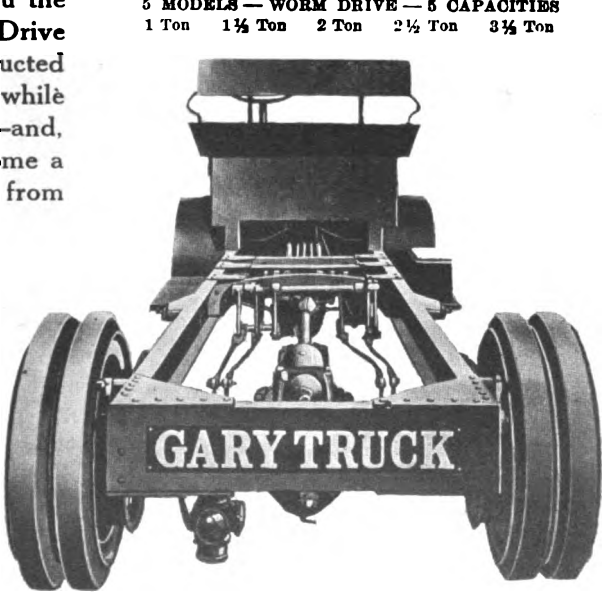
Standardized units used as standard equipment in Gary trucks:

Buda, Eisemann, Stromberg, Raybestos, Sheldon, Tuthill, Fuller, Warner, Hayes, Goodrich, Goodyear, Lavine, Ross, Simplex, Duplex, Pierce, Parish & Bingham, Blood Bros., Hartford, Perfex.

Vesta electric lighting equipment as an extra.

5 MODELS — WORM DRIVE — 5 CAPACITIES

1 Ton 1½ Ton 2 Ton 2½ Ton 3½ Ton



GARY MOTOR TRUCK CO.

GARY, IND.

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Gasoline Commercial Vehicles—(Continued)

Brief Specifications, Prices and Names and Addresses of Manufacturers

Model No. or Name	Manufacturer's Name and Address	Load Capacity, Tons	No. of Cylinders, Bore and Stroke of Motor	Make of Motor	N.A.C.C. H.P.	Wheelbase	Size of Tires Front	Size of Tires Rear	Price
Federal	Federal Motor Truck Co., Detroit, Mich.								
	Model S	1	4-3½x5½	Own	19.6	132	34x3	34x4	$1.900
	Model T	1½	4-3½x5½	Own	19.6	144	36x3½	36x5	2,350
	Model U	2	4-3½x5½	Own	19.6	144	36x4	36x7	2,600
	Model W	3½	4-4¼x5½	Own	28.9	156	36x5	36x5D	3,350
	Model X	5	4-4¼x5½	Own	28.9	156	36x6	40x6D	4,400
Ford	Ford Motor Co., Woodward Ave. (Highland Park), Detroit, Mich.								
	Model	1	4-3¾x4	Own	22.5	124	30x3	32x3½	600
Forschler	Forschler Motor Truck Mfg. Co., New Orleans, La.								
	Model S	¾	4-3⅛x4½	LeRoi	15.6	106	32x2½	32x3	1,225
	Model A	1	4-3½x5	Continental	19.6	120	34x3	34x4	1,900
	Model AX	1½	4-3½x5	Continental	19.6	120	34x3½	34x5	2,200
	Model B	2	4-4⅛x5¼	Continental	27.2	138	34x4	34x6	2,750
Four Wheel Drive See page 47	**Four Wheel Drive Auto Co., Dept. Y, Clintonville, Wis.**								
	Model B	3	4-4¾x5½	**Wisconsin**	36.1	124	36x6	36x6	4,600
Frontmobile	Camden Motors Corp., 415 Market St., Camden, N. J.								
	Model J	1	4-3¼x5	Herschell-Spill.	16.9	136	34x3½	34x5	1,620
Fulton	Fulton Motor Truck Co., Farmingdale, N. Y.								
	Model FX	1½	4-3¼x5	Herschell-Spill.	16.9	132	34x3½	34x4	1,750
G. M. C. See page 57	**General Motors Truck Co., Pontiac, Mich.**								
	Model 16	¾	4-3¾x5	**Continental**	22.5	132	35x5P	35x5P	1,495
	Model 21	1	4-3¾x5	**Continental**	22.5	136	34x3½	34x5	1,950
	Model 31	1½	4-3¾x5	**Continental**	22.5	130 / 144	36x3½	36x5	2,350
	Model 41	2	4-4⅛x5¼	**Continental**	27.2	144 / 158	36x4	36x4D	2,800
	Model 71-A	3½	4-4½x5½	**Continental**	32.4	163 / 187	36x5	40x5D	3,900
	Model 101-A	5	4-4½x5½	**Continental**	32.4	163 / 187	36x6	40x6D	4,500
Gabriel	Gabriel Motor Truck Co., 315 Prospect Ave., N. W., Cleveland, Ohio.								
	Model C	1	4-4 x5½	Buda	25.6	126	35x5P	35x5P	2,000
	Model D	1½	4-4⅛x5½	Buda	27.2	144	36x4	36x5	2,500
	Model E	2	4-4¼x5½	Buda	28.9	156	36x4	36x7	3,250
	Model F	3½	4-4½x6	Buda	32.4	180	36x5	40x10	4,300
Garford	Garford Motor Truck Co., Wapak Rd., Lima, Ohio.								
	Model 75-C	1	4-3¾x5½	Buda	22.5	128	34x4½P	36x4	2,500
	Model 66-B	1½	4-3¾x5½	Buda	22.5	144	36x3½	36x5	3,000
	Model 70-B	2	4-4¼x5½	Buda	28.9	144	36x4	36x7	3,300
	Model 77-B	3½	4-4¼x6	Wisconsin	28.9	128	36x5	40x5D	4,300
	Model 68	5	4-4¾x5½	Wisconsin	36.1	128	36x6	40x6D	5,000
	Model 69	6	4-5 1/16x5½	Wisconsin	41.6	128	36x6	40x7D	5,300
Gary See page 41	**Gary Motor Truck Co., Gary, Ind.**								
	Model F	1	4-3¾x5	**Continental**	22.5	130	36x3½	36x4	
	Model G	1½	4-4¼x5½	**Buda**	28.9	144	36x3½	36x5	
	Model H	2	4-4¼x5½	**Buda**	28.9	156	36x4	36x6	
	Model HU	2½	4-4¼x5½	**Buda**	28.9	162	36x4	36x7	
	Model K	4	4-4½x6	**Buda**	32.4	162	36x5	36x5D	
Geneva	Geneva Wagon Co., Geneva, N. Y.								
	Model B	¾	2-5⅛x4½	Beaver	21.0	100	34x2P	36x3½P	700
Gersix	Gersix Mfg. Co., Seattle, Wash.								
	Model G	2½	6-3½x5¼	Buda	29.4	150	36x4	36x7	3,150
	Model H	2½	6-3½x5¼	Buda	29.4	170	36x4	36x7	3,150
	Ghent Motor Car Co.—See Victor								
Giant See page 259	**Chicago Pneumatic Tool Co. 1039 Fisher Bldg., Chicago, Ill.**								
	Model 15	1	4-3½x5	**Continental**	19.6	138	34x3½	34x5	1,850
	Model 16	2	4-4⅛x5¼	**Continental**	27.2	144	36x4	36x7	2,850
	Model 17	3½	4-4½x5½	**Continental**	32.4	176	36x5	36x5D	3,850

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With the production of passenger cars being cut down more and more—the automobile dealer must look to the motor truck as a sales proposition.

The motor truck is here to stay—get into this profitable all-year line.

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Gasoline Commercial Vehicles—(Continued)

Brief Specifications, Prices and Names and Addresses of Manufacturers

Model No. or Name	Manufacturer's Name and Address		Load Capacity, Tons	No. of Cylinders, Bore and Stroke of Motor	Make of Motor	N.A.C.C. H.P.	Wheelbase	Size of Tires Front	Size of Tires Rear	Price
Globe	Globe Motor Truck Co., 1100 Pine St., East St. Louis, Ill.									
		Model A	1	4-3½x5	Continental	19.6	132	34x3½P	34x4P	1,490
		Model B	1½	4-3¾x5¼	Continental	22.5	144	36x3½	36x5	1,850
		Model C	2	4-4⅛x5¼	Continental	27.2	154	36x4	36x6	2,190
Gramm-Bernstein	Gramm-Bernstein Motor Truck Co., Lima, Ohio.	Model 1W	1	4-3¾x5¼	Waukesha	22.5	124	34x3½	34x4	.....
		Model 1½W	1½	4-3¾x5¼	Waukesha	22.5	130	34x3½	36x5	2,450
		Model 2W	2	4-4¾x5¼	Waukesha	22.5	146	34x4	34x3½	2,750
		Model 2½W	2½	4-4½x5¾	Waukesha	32.4	156	36x4	36x4D	3,350
		Model 3½W	3½	4-4½x5¾	Waukesha	32.4	158	36x5	40x5D	4,000
		Model 5W	5	4-4¾x6¾	Waukesha	36.1	168	36x6	40x7	5,000
Grant	Grant Motor Car Corp., Coit Rd. & Kirby Ave., Cleveland, Ohio.									
		Model 12 lbs.	1800	4-3¼x5	Herschell-Spill.	16.9	115	32x4P	32x4P	1,125
		Model 10	1½	4-3¾x5	Continental	22.5	124	34x4½P	34x5	1,540
		Model 11	1½	4-3¾x5	Continental	22.5	140	34x4½P	34x5	1,635
		Model 15	2	4-3¾x5	Continental	22.5	124	34x4	34x6	1,850
		Model 16	2	4-3¾x5	Continental	22.5	140	34x4	34x6	1,950
Hahn	Hahn Motor Truck Co., Hamburg, Pa.									
		Model B	¾	4-3½x5	Continental	19.6	120	34x3P	34x3½	1,200
		Model G	1	4-3½x5	Continental	19.6	132	34x3	34x4	1,350
		Model C	1¼	4-4⅛x5¼	Continental	27.2	135	36x3½	36x5	1,950
		Model H	2	4-4⅛x5¼	Continental	27.2	140	34x3½	34x6	2,000
		Model E	2½	4-4½x5½	Continental	32.4	172	36x4	36x4D	2,500
		Model F	3½	4-4½x5½	Continental	32.4	175	36x5	36x5D	3,400
		Model I	5	4-4½x5½	Continental	32.4	185	36x6	38x6	4,200
Hall	**Lewis-Hall Iron Works, Detroit, Mich.**									
See page 53		**Model**	**2**	**4-4⅛x5¼**	**Continental**	**27.2**	**156**	**34x4**	**34x4D**	.....
		Model	**3½**	**4-4½x5½**	**Continental**	**32.4**	**144**	**36x5**	**36x5D**	.....
		Model	**5**	**4-4½x5½**	**Continental**	**32.4**	**156**	**36x5**	**40x6D**	....
		Model	**7**	**4-4½x5½**	**Continental**	**32.4**	**156**	**36x5**	**40x6D**	....
Harvey	**Harvey Motor Truck Co. Harvey Ill.**									
See page 47		**Model W. F. A**	**2½**	**4-4¼x5½**	**Buda**	**28.9**	**150**	**36x4**	**36x7**	**2,850**
		Model W. H. A	**3½**	**4-4½x6**	**Buda**	**32.4**	**160**	**36x5**	**36x5D**	**3,850**
		Model W. K. A	**5**	**4-4½x6**	**Buda**	**32.4**	**160**	**36x6**	**40x6D**	**4,600**
Hawkeye	**Hawkeye Truck Co., 2700 Floyd Ave., Sioux City, Iowa.**									
See page 47		**Model K**	**1½**	**4-3¾x5½**	**Buda**	**22.5**	**148½**	**34x3½**	**34x5**	**1,900**
		Model L	**2**	**4-3¾x5½**	**Buda**	**22.5**	**148½**	**34x4**	**36x6**	**2,500**
Higrade	Higrade Motors Co., Harbor Springs, Mich.	Model A-18	1	4-3½x5	Continental	19.6	115	35x5	35x5	.....
Hoover	**Hoover Wagon Co., York, Pa.**									
See page 219		**Model 15 B**	**¾**	**4-3½x5**	**Continental**	**19.6**	**120**	**32x4**	**33x4½P**	.....
		Model 20 A	**1¼**	**4-3½x5**	**Continental**	**19.6**	**130**	**34x4**	**34x5**	.....
Hupmobile	**Hupp Motor Car Corp., Detroit, Mich.**									
See page 23		**Model lbs.**	**800**	**4-3¼x5½**	**Own**	**16.9**	**112**	**32x4P**	**32x4P**	**1,350**
Hurlburt	Hurlburt Motor Truck Co., New York City									
		Model 2	2	4-4¼x5½	Buda	28.9	148	36x4	36x4D	.....
		Model 3½	3½	4-4½x6	Buda	32.4	146	36x5	36x5D	.....
		Model 5	5	4-4½x6	Buda	32.4	156	36x5	40x6D	.....
Independent	Independent Motor Truck Co., Davenport, Iowa.	Model	1	4-3½x5	Continental	19.6	134	34x3	34x4	1,550
		Model	1½	4-3¾x5	Continental	22.5	140	34x3½	34x5	1,890
		Model	2	4-4⅛x5½	Continental	27.2	146	34x4	34x6	2,290
Indiana	**Indiana Truck Corp., Dept. 16, Marion, Ind.**									
See page 45		**Model T**	**1**	**4-3¾x5¼**	**Waukesha**	**22.5**	**135**	**34x3½**	**34x4**	**1,975**
		Model Q	**1½**	**4-4¼x5½**	**Rutenber**	**27.2**	**144**	**36x3½**	**36x5**	**2,600**
		Model D	**2**	**4-4⅛x5½**	**Rutenber**	**27.2**	**144**	**36x3½**	**36x5**	**2,800**
		Model R	**3½**	**4-4⅜x5½**	**Rutenber**	**30.6**	**156**	**36x5**	**36x5D**	**3,450**
		Model L	**5**	**4-4¾x6¾**	**Waukesha**	**36.1**	**167**	**36x5**	**40x6D**	**4,600**
International	International Harvester Co. of America, Harvester Bldg., Chicago, Ill.									
		Model H	¾	4-3½x5¼	Own	19.6	115	36x3	36x3½	1,550
		Model F	1	4-3½x5¼	Own	19.6	128	36x3½	36x4	1,850
							148	.....	.....	1,900
		Model K	1½	4-3½x5¼	Own	19.6	128	36x2½	36x5	2,200
							146	.....	.....	2,250
		Model G	2	4-4 x5	Own	25.6	135	36x4	36x6	2,600
							160	.....	.....	2,650

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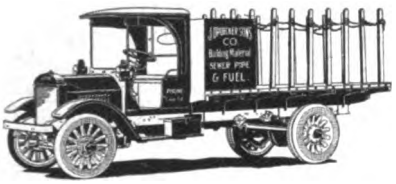
WOLVERINE

1½ Ton Truck

The Truck of Good Service

Motor—Continental, 3¾" x 5" stroke. Thermo-Syphon cooled.
Ignition—Two unit Starting, Lighting and Ignition system—together with Magneto and storage battery.
Rear Axle—Russell Internal Gear Drive.
Wheelbase—140 inches.
Illustrated catalog and complete details mailed upon request. Write us today.

THE AMERICAN COMMERCIAL CAR CO., Detroit, Mich.



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The Indiana line makes big money for dealers, due to the quality and rapid selling features of Indiana Trucks. Ask us whether your territory is still open.

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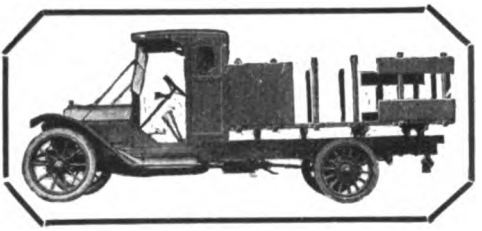
Founded 1898 — **Marion, Ind. U.S.A.**
Dept. 16



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Write for particulars.

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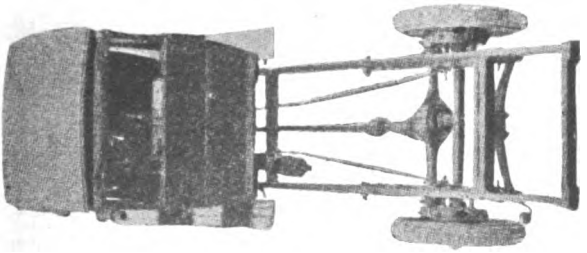
Strength—Power—Simplicity—Accessibility



The big outstanding feature of the Reliance Truck is its remarkable "external gear drive" axle.
This idea has solved a big problem in motor truck construction.
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Reliance Motor Truck Co.
Appleton, Wisc.

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Gasoline Commercial Vehicles—(Continued)

Brief Specifications, Prices and Names and Addresses of Manufacturers

Model No. or Name	Manufacturer's Name and Address	Load Capacity, Tons	No. of Cylinders, Bore and Stroke of Motor	Make of Motor	N.A.C.C. H.P.	Wheelbase	Size of Tires Front	Size of Tires Rear	Price
	International Motor Co.—See Mack.								
Jumbo	Nelson Motor Truck Co., Saginaw, Mich.								
	Model A	2½	4-4¼x5½	Buda	28.9	144	35x4	35x6	2,250
	Model B	2½	4-4¼x5½	Buda	28.9	168	35x4	35x6	.....
Kearns	Kearns Motors Co., Beavertown, Pa.								
	Model C. D.	½	4-3¼x5	Lycoming	16.9	107	30x3½P	30x3½P	850
Kelly-Springfield	Kelly-Springfield Motor Truck Co., Springfield, Ohio								
	Models K 31, 32	1½	4-3¾x5¼	Own	22.5	144	36x3½	36x6	2,750
	Models K 35, 36	2½	4-3¾x5¼	Own	22.5	144	36x4	36x4D	3,250
	Model K 40	3½	4-4½x6½	Own	32.4	150	36x5	40x5D	4,250
	Model K 45	4	4-4½x6½	Own	32.4	150	36x5	40x6D	4,400
	Model K 50	5	4-4½x6½	Own	32.4	150	36x6	40x6D	4,900
	Model K 60	6	4-4½x6½	Own	32.4	150	36x6	40x7D	5,200
	Kentucky Wagon Mfg. Co.—See Old Hickory.								
King	King Mfg. Co., Kingston, N. Y.								
	Model	3½	4-4½x5½	Continental	32.4	120	36x5	36x5D	3,000
Kissel	Kissel Motor Car Co., 400 Kissel Ave., Hartford, Wis.								
	Model Gen. Utility	1½	4-3⅞x5½	Own	24.0	152	34x3½	34x5	2,073
	Model Freighter	2	4-4¼x5½	Own	28.9	168	34x4	36x7	2,832
	Model Heavy Duty	3½	4-4¼x5½	Own	28.9	168	36x5	36x5D	3,905
	Model Dreadnaught	5	4-4¼x5½	Own	28.9	180	36x6	36x6D	4,785
Kleiber	Kleiber & Co., San Francisco, Cal.								
	Model AA	1	4-3¾x5¼	Continental	22.5	130	34x3½	34x5	2,400
	Model A	1½	4-4⅛x5¼	Continental	27.2	140	36x3½	36x6	2,650
	Model B-B	2	4-4⅛x5¼	Continental	27.2	140	36x4	36x3½D	2,950
	Model B	2½	4-4½x5½	Continental	32.4	150	36x4	36x4D	3,500
	Model C	3½	4-4½x5½	Continental	32.4	158	36x5	36x5D	4,100
	Model D	5	4-5¼x5¾	Continental	44.1	170	36x6	40x6D	5,100
Koehler	Koehler Motors Corp., H. J., 154 Ogden St., Newark, N. J.								
	Model K	1½	4-3½x5	Own	19.6	129	34x3	34x4	1,450
	Model L	3	4-3½x5	Own	19.6	151	34x4	34x6	1,985
Kuhn	Kuhn Tractor Truck Co., 320 Terry Ave., N., Seattle, Wash.								
	Model	5	4-4¼x5	Wisconsin	28.9	138	37x7	37x7	.....
La France	La France Truck Co., Ward, Elmira, N. Y.								
	Model 2-A	2	4-4⅛x5¼	.....	27.2	156	36x4	36x7	.....
Lane See page 37	Lane Motor Truck Co., Kalamazoo, Mich								
	Model F	1½	4-3¾x5	Continental	22.5	144	34x4	34x6	2,256
	Model B	2½	6-3½x5¼	Continental	29.4	160	34x4	36x7	2,850
	Model C	3½	6-3¾x5¼	Continental	33.7	160	36x5	36x5D	3,700
Lange	Lange Motor Truck Co., Pittsburgh, Pa.								
	Model F	1½	4-4⅛x5¼	Continental	27.2	135	36x4	38x6	1,950
	Model B	2½	4-4⅛x5¼	Continental	27.2	135	36x4	38x6	2,650
Larrabee	Larrabee-Deyo Motor Truck Co., Binghamton, N. Y.								
	Model M	1	4-3¾x5	Continental	22.5	130	34x3½	34x5	1,950
	Model P	2½	4-4⅛x5¼	Continental	27.2	154, 166	36x4	36x7	3,000
	Model RS	3½	4-4½x5½	Continental	32.4	154, 166	36x5	36x5D	3,950
	Model T	5	4-4½x5½	Continental	32.4	176	36x6	40x6D	4,750
	Lewis-Hall Iron Works.—See Hall.								
Lippard-Stewart	Lippard-Stewart Motor Car Co., 226 W. Utica St., Buffalo, N. Y.								
	Model W	¾	4-3¾x5¼	Continental	22.5	135	35x4½P	35x4½P	1,900
	Model H	1	4-3¾x5¼	Continental	22.5	145	36x3	36x5	2,250
	Model F	1½	4-4⅛x5¼	Continental	27.2	158	36x3½	36x3D	2,750
	Model G	2	4-4⅛x5¼	Continental	27.2	165	36x4	36x4D	3,050
	Locomobile Co. of America—See Riker.								

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Heavy Service Trucks

HARVEY trucks are soundly established. Since 1910, when the first HARVEY trucks were manufactured, HARVEY policy has been "Built-In Service," demanding the highest standards of quality in every detail without regard for manufacturing cost.

WORM DRIVE

2½-ton Chassis $2850
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Applications invited from responsible distributors.

Harvey Motor Truck Co.
Harvey, Ill.
(Chicago Suburb)

HAWKEYE
1½ and 2 TON MOTOR TRUCKS

SPECIFICATIONS

Wheelbase .....148"
Motor....Buda, 4-cyl., 3¾"x5½"
Simplex Governor.
Eisemann Magneto Ignition.
Pump Circulation Cooling.
Clutch, Dry-Plate Disc.
Radiator, Independent Mounting.
Transmission, Sliding Gear.
1½-ton.....3 forward speeds
2 -ton.....4 forward speeds
Rear Axle, "Celfor" Internal Gear.

PRICE
(Chassis Only)

1½-ton $1,900
2- ton $2,500

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HAWKEYE TRUCK COMPANY
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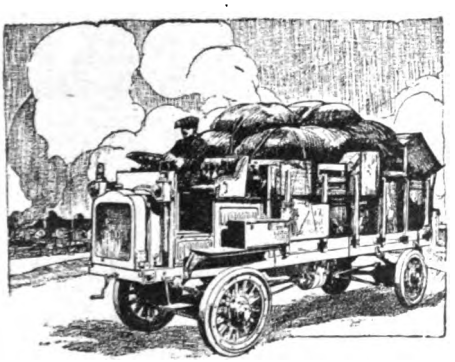

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IN addition to their great advantage of four wheel driving power—every wheel a driving wheel—proper weight distribution is another point of immense superiority in F-W-D Trucks. Hard, continuous road service only emphasizes their reliable performance and economical operation.

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Massive construction —colossal strength—gigantic motive power—abundant speed in operation—proven power of endurance, with energy in reserve.

One to Five Ton Models
WORM & INTERNAL DRIVE

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Gasoline Commercial Vehicles—(Continued)

Brief Specifications, Prices and Names and Addresses of Manufacturers

Model No. or Name	Manufacturer's Name and Address	Load Capacity, Tons	No. of Cylinders, Bore and Stroke of Motor	Make of Motor	N.A.C.C. H.P.	Wheelbase	Size of Tires Front	Size of Tires Rear	Price
Maccar	Maccar Truck Co., Scranton, Pa.								
	Model L	1½	4–4⅛x5¼	Continental	27.2	150	36x4	36x5	2,550
	Model H	2½	4–4½x5½	Continental	32.4	162	36x4	36x4 D	3,100
	Model M	3½	4–4½x5½	Continental	32.4	174, 186	36x5	36x5 D	4,000
	Model U	5½	4–5 1/16x5½	Wisconsin	40.0	168, 186	36x5	40x6 D	5,000
Mack	International Motor Co., 252 W. 64th St., New York, N. Y.								
	Model AB	1	4–4 x5	Own	25.6	132, 144	36x4	36x3½D	.....
	Model AB	1½	4–4 x5	Own	25.6	144, 162	36x4	36x3½D	.....
	Model AB	2	4–4 x5	Own	25.6	144, 162, 156	36x4	36x4 D	.....
	Model AC	3½	4–5 x6	Own	40.0	168, 180, 156	36x5	40x5 D	.....
	Model AC	5½	4–5 x6	Own	40.0	168, 180, 156	36x6	40x6 D	.....
	Model	7½	4–5 x6	Own	40.0	168, 180	36x7	40x7 D	.....
Manly	O'Connell-Manly Truck Co., Waukegan, Ill.								
	Model 30	1½	4–3¾x5¼	Waukesha	22.5	144, 168	36x4	36x5	2,050
	Model 40	2	4–3¾x5¼	Waukesha	22.5	144, 168	36x4	40x6	2,350
	Model 50	2½	4–4 x5¾	Waukesha	25.6	156, 180	36x4	40x7	2,800
	Model 60	3	4–4¼x5¾	Waukesha	28.9	156, 180	36x5	40x8	3,150
	Martin Truck & Body Corp.—See Atlas.								
Master	Master Trucks, 3132-36 Wabash Ave., Chicago, Ill.								
	Model M	2	4–4¼x5½	Buda	28.9	144	34x4	36x6	2,390
	Model O	2	4–4¼x5½	Buda	28.9	170	34x4	36x6	2,490
	Model W	2	4–4¼x5½	Buda	28.9	144	34x4	36x6	2,590
	Model A	3½	4–4½x6	Buda	32.4	158	36x5	40x5 D	3,890
Maxwell See page 55	**Maxwell Motor Sales Corp., Detroit, Mich.**								
	Model	**1**	**4–3⅝x4½**	**Own**	**21.3**	**124**	**32x3**	**32x4**	**1,085**
	Model 25 lbs.	**1250**	**4–3⅝x4½**	**Own**	**21.3**	**109**	**30x3½P**	**30x3½P**	**810**
Menominee	Menominee Motor Truck Co., Broadway, Menominee, Mich.								
	Model Hurryton	1	4–4¾x5	Continental	22.5	130	34x3½	34x5	1,775
	Model H	1½	4–3¾x5¼	Continental	36.1	130, 144	36x3½	36x5	2,290
	Model D	2	4–4⅛x5¼	Continental	27.2	144, 160	36x4	36x4D	2,715
	Model G	3½	4–4⅛x5½	Continental	32.4	160	36x5	36x5D	3,580
	Model J	5	4–4¾x5½	Wisconsin	36.1	160	36x6	40x6D	4,540
Midland	Midland Motor Car & Truck Co., Penobscot Bldg., Oklahoma City, Okla.								
	Model M	2	4–4⅛x5¼	Continental	27.2	150	36x4	36x7	.....
	Milwaukee Locomotive Mfg. Co.—See Walter.								
Minneapolis See page 21	**Minneapolis Motor Car Co., 235 Plymouth Bldg., Minneapolis, Minn.**								
Moreland	Moreland Motor Truck Co., 1701 N. Main St., Los Angeles, Cal.								
	Model 17 N	1	4–4¾x5	Continental	22.5	126	34x3½	34x4	2,175
	Model 17 B	1½	4–4⅛x5¼	Continental	27.2	126	36x3½	36x5	2,930
	Model 17 C	2½	4–4½x5½	Continental	32.4	144	36x4	36x7	3,500
	Model 17 G	4	4–4¾x6¾	Waukesha	36.1	162	36x5	40x5D	4,500
	Model 17 J	5	4–4¾x6¾	Waukesha	36.1	180	36x6	40x6D	5,000
Muskegon See page 55	**Muskegon Engine Co., Muskegon, Mich.**								
	Model 20	**2**	**4–4⅛x5¼**	**Continental**	**27.2**	**144**	**36x4**	**36x6**	**2,325**
Myers	Myers Machine Co., 1002-18 Indiana Ave., Sheboygan, Wis.								
	Model B	1½	4–3½x5¼	Waukesha	19.6	136	34x3½	34x4	1,780
	Model C	2½	4–4 x5¾	Waukesha	25.6	156	36x4	36x6	2,800
	Model E	5	4–4¾x6¾	Waukesha	36.1	160	36x6	40x6D	.....

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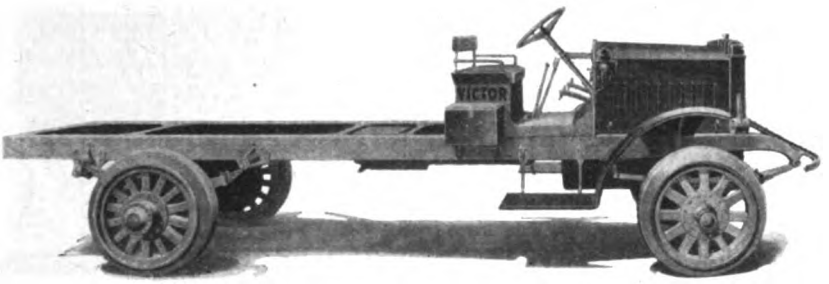
VICTOR

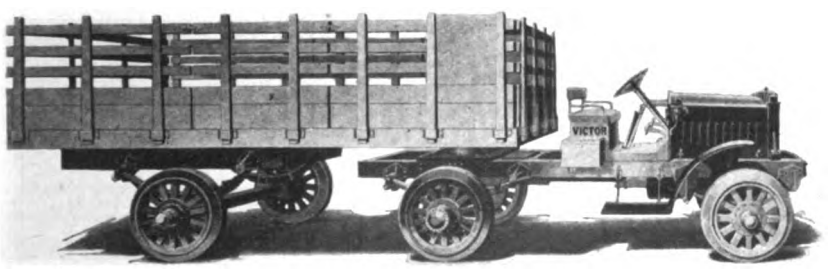
TRUCKS and TRAILERS



MODEL 2L—2 TON CAPACITY

SPECIFICATIONS

MOTOR: Red Seal Continental, 4 cylinder, bore 4⅛ inches, stroke 5¼ inches. Motor equipped with PIERCE speed limit governor.
CLUTCH: Brown-Lipe. Multiple disc type, steel discs against Raybestos surfaces. Enclosed in motor bell housing.
TRANSMISSION: Brown-Lipe. Heavy duty truck type located amidship. Three speeds forward and reverse. Selective sliding. Timken roller bearings throughout.
REAR AXLE: Timken Detroit Axle Co. Worm drive full floating on Timken Roller Bearings. Worm and gear manufactured by Timken, David Brown Co. Gear ratio 7⅝ to one. Road speed 15 miles per hour.
FRONT AXLE: Timken Detroit Axle Co. Standard heavy truck type, I-beam section; Timken Roller Bearings in wheels and steering knuckle thrusts.
SPRINGS: Semi-elliptic front and rear. Rear 52 inches long, 3 inches wide. Front 40 inches long, 2¼ inches wide.
STEERING GEAR: Ross irreversible worm and nut adjustable. Eighteen inch wheel.
IGNITION: Bosch D. U.—4 Type. High tension with fixed setting. Fool proof.
CARBURETOR: Stromberg Model M with hot air ducts.
RADIATOR: Flat tubular type. Temperature control adjusted from driver's seat. Radiator suspended on cushion supports.
CONTROL: Gear shift and brake levers in center. Left hand drive. Carburetor control by foot accelerator with auxiliary motor starting control on dash.
WHEELBASE: 166 inches. Two lengths of frame optional, 12 and 14 foot loading space.
TIRES: 36x6 inches solid single in rear. Front 36x4 solid single.
STANDARD STAKE BODY: Length 12 foot clear loading space, width 6 foot. Special body prices on application.
CHASSIS WEIGHT: 4400 pounds.
STANDARD EQUIPMENT: 2 oil side lamps. Oil tail lamp. Railroad type: Tool Box, Jack and full kit of tools. Hand operated mechanical horn. Motometer.
PRICES: Chassis in two coats of lead $2800 F.O.B. Chicago. With Standard stake body painted yellow, with black gear, $3,100.



MODEL O—6-TON SEMI-TRAILER

SPECIFICATIONS

CAPACITY: Six tons.
DIMENSION: 16 feet long, 6 feet wide.
TREAD: 58½ inches.
REAR AXLE: Drop-Forged of square section 3 inch face. Wheels mounted on roller bearings.
WHEELS: 36 inches in diameter. Artillery type wood. 3 inch sprokes.
TIRES: 36x7 inch solid single.
ROCKING FIFTH WHEEL: This is the Martin Rocking Fifth Wheel which is in general use in trailer construction. It is so devised that regardless of the unevenness of roads there is no distortion of the trailer. Provision is made for uncoupling the trailer instantly.
BODY: Standard body as shown in illustration. Special body prices on application.
PRICE: In two coats of lead $900 f.o.b. Chicago.
Dealers: Write for proposition for your territory.

VICTOR MOTOR TRUCK and TRAILER CO.

CHICAGO **401 N. Hoyne Ave.** **ILLINOIS**

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Gasoline Commercial Vehicles—(Continued)

Brief Specifications, Prices and Names and Addresses of Manufacturers

Model No. or Name	Manufacturer's Name and Address	Load Capacity. Tons	No. of Cylinders, Bore and Stroke of Motor	Make of Motor	N.A.C.C. H.P.	Wheelbase	Size of Tires Front	Size of Tires Rear	Price
Nash	Nash Motors Co., Kenosha, Wis.								
	Model 2018	1	4-3¾x5¼	Own	22.5	130	34x3	34x4	1,650
	Model 3018	2	4-3¾x5¼	Own	22.5	144	34x4	34x6	2,175
	Model 4018	2	4-4¼x3½	Buda	28.9	124	36x5	36x5	3,250
	Nelson Motor Truck Co.—See Jumbo								
Nelson-LeMoon	Nelson-LeMoon, Chicago, Ill.								
	Model F1	1	4-3¾x5¼	Continental	22.5	Opt	36x3	36x4	.....
	Model F1½	1½	4-3¾x5¼	Continental	22.5	Opt	36x3½	36x5	1,700
	Model F2	2	4-4⅛x5¼	Continental	27.2	Opt	36x4	36x7	2,250
	Model F3½	3½	4-4½x5½	Continental	32.4	Opt	36x5	36x5D	.....
	New England Truck Co.—See Netco.								
Netco	New England Truck Co., 86 Lunenburg St., Fitchburg, Mass.								
	Model D	2	4-4⅛x5¼	Continental	27.2	144	36x4	36x6	2,800
	Model H	2½	4-4½x5½	Continental	32.4	168	36x4	36x7	3,200
Noble	Noble Motor Truck Corp., S. Main St., Kendallville, Ind.								
	Model NW2	2½	4-4⅛x5¼	Continental	27.2	148	36x4	36x7	2,675
	Model NW4	4	4-4½x5½	Continental	32.4	168	36x5	36x5	3,675
Norwalk	Norwalk Motor Car Co., Martinsburg, W. Va.								
	Model 2000	1	4-3½x5	Lycoming	19.6	130	34x4P	34x4	1,495
	Model 3000	1½	4-3½x5	Lycoming	19.6	130	34x3½	34x5	1,750
Old Hickory	Kentucky Wagon Mfg. Co. Third and K Sts., Louisville, Ky.								
	Model M	¾	4-3¼x5	Lycoming	16.9	112	33x4P	33x4P	995
Old Reliable	Old Reliable Motor Truck Co., 3913-27 S. Michigan Ave., Chicago, Ill.								
	Model WA	1½	4-4 x5	Wisconsin	25.6	138 150	34x3½	36x6	2,350
	Model WB	2½	4-4¼x6	Wisconsin	28.9	160	34x4	36x4	3,250
	Model WC	3½	4-4¼x6	Wisconsin	28.9	160	34x5	36x5D	4,000
	Model WD	5	4-5 1/16x5½	Wisconsin	41.6	166	36x6	40x7D	5,000
	Model WCO	5	4-4¾x5½	Wisconsin	36.1	126	36x6	36x6D	5,000
	Model WCP	7	4-4¾x6¾	Waukesha	36.1	124 136	36x6	40x7D	6,000
Oneida	Oneida Motor Truck Co. Webster and Willow Sts., Green Bay, Wis.								
	Model A	1	4-3¾x5¼	Continental	22.5	130 140	36x3½	36x5	2,290
	Model B	1½	4-3¾x5¼	Continental	22.5	144	36x3½	36x5	2,650
	Model C	2	4-4⅛x5¼	Continental	27.2	144	36x4	36x4D	3,000
	Model D	3½	4-4½x5½	Continental	32.4	160 170	36x5	36x5D	3,700
	Model E	5	4-5¼x5¾	Continental	44.1	170 190	36x6	40x12	4,750
Oshkosh **See page 51**	**Oshkosh Motor Truck Mfg. Co. Oshkosh Wis.**	**1½**	**4-3¼x5**	**Herschell-Spill.**	**16.9**	**130**	**34x5**	**34x5**	**2,985**
Overland **See page 29**	**Willys-Overland, Inc., Toledo, Ohio**								
	Model Panel ..... lbs.	**800**	**4-3⅜x5**	**Own**	**18.2**	**104**	**31x4P**	**31x4P**	**1045**
	Model Express .... lbs.	**1200**	**4-4⅛ 4½**	**Own**	**27.2**	**106**	**33x4½P**	**33x4½P**	**1150**
Packard	Packard Motor Car Co. E. Grand Blvd. & Belt Line, Detroit, Mich.								
	Model 1E	1	4-4 x5½	Own	25.6	126	34x3½	34x6	2,650
	Model 1½E	1½	4-4 x5½	Own	25.6	126	34x3½	34x3½D	3,000
	Model 2E	2	4-4 x5½	Own	25.6	144	34x4	34x4D	3,400
	Model 3E	3	4-4½x5½	Own	32.4	156	36x5	36x5D	4,100
	Model 4E	4	4-4½x5½	Own	32.4	156	36x5	40x5D	4,450
	Model 5E	5	4-5 x5½	Own	40.0	156	36x6	40x6	5,150
	Model 6E	6	4-5 x5½	Own	40.0	156	36x6	40x7	5,400
Packet	Packet Motor Car Mfg. Co., Minneapolis, Minn. Model 1	3/10	4-2¾x4	Own	12.1	100	28x3P	28x3P	299
Panhard	Panhard Motors Co., Grand Haven, Mich.								
	Model A	1	4-3½x5	Gray	19.6	125	32x3½P	32x3½	1,195
	Model B	1½	4-3½x5	Gray	19.6	130	32x3½P	32x4	1,395
Parker	Parker Motor Truck Co. 608 Linus St. Milwaukee, Wis. Model	2	6-3½x5¼	Continental	29.4	150	36x4	36x6	2,800
	Model	3	6-3½x5¼	Continental	29.4	160	36x4	36x7	3,350
	Model	4	6-3¾x5¼	Continental	33.7	160	36x5	40x5D	4,000
	Model	5	6-3¾x5¼	Continental	33.7	168	36x5	40x6D	4,700

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1½ Ton

"OSHKOSH"
4-Wheel Drive Trucks

Only with the motive power transmitted to all four wheels is maximum TRACTION PULL made possible: it eliminates waste energy, is lighter, more powerful, and far more economical than the truck driven by rear wheels alone.

The advantage of the PUSH-PLUS-PULL principle, the basic distinction between the "OSHKOSH" and rear-driven trucks, are quickly grasped.

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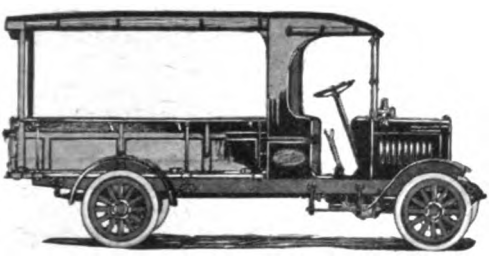
OSHKOSH MOTOR TRUCK MFG. CO. - OSHKOSH, WIS.

VICTOR MOTOR TRUCK



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GHENT MOTOR CAR CO.
Ottawa, Ill.

Seneca Motor Cars
Seneca 4-27

solves the solution for an ideal family and business car having all conveniences and refinements; combined with a sturdiness which insures safety and minimum maintenance.

Motor—4 cyl., removable head
Ignition—Remy
Starting & Lighting—Allis-Chalmers
Springs—True Cantilever
Wheelbase—108".

SENECA MOTOR CAR CO. Fostoria, Ohio

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COLUMBIA MOTOR TRUCK & TRAILER CO.
Pontiac, Mich.

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Gasoline Commercial Vehicles—(Continued)

Brief Specifications, Prices and Names and Addresses of Manufacturers

Model No. or Name	Manufacturer's Name and Address	Load Capacity, Tons	No. of Cylinders, Bore and Stroke of Motor	Make of Motor	N.A.C.C. H.P.	Wheelbase	Size of Tires Front	Size of Tires Rear	Price
Peerless	Peerless Motor Car Co. Quincy Ave. and S. E. 93rd St., Cleveland, Ohio.								
	Model T. C-3	3	4-4½x6½	Own	32.4	151	36x4	40x4D	4,000
	Model T. C-4	4	4-4½x6½	Own	32.4	151	36x5	40x5D	4,150
	Model T. C-S	5	4-4½x6½	Own	32.4	151	38x6	42x6D	4,700
	Model T. C-6	6	4-4½x6½	Own	32.4	151	38x7	42x7D	5,200
Pierce-Arrow	Pierce-Arrow Motor Car Co., Buffalo, N.Y.								
	Model X4	2	4-4 x5½	Own	25.6	150	36x4	36x4D	3,750
	Model R8	5	4-4⅞x6	Own	38.0	168, 204	36x5	40x6D	5,000
Rainier	Rainier Motor Corp. Bay Side Ave. and L. I. R. R., Flushing, N. Y.								
	Model R-5	½	4-3¼x4½	Light	16.9	115	33x4P	33x4P	1,250
	Model R-2	¾	4-3¼x4½	Light	16.9	125	34x4P	34x4P	1,350
	Model R-4	1¼	4-3¼x4½	Light	16.9	125	32x4	32x4	1,595
	Model R-6	1½	4-3½x5⅛	Continental	19.6	133	34x4	34x4	1,790
Reliance See page 45	**Reliance Motor Truck Co., Appleton, Wis.**								
Rennoc-Leslie	Rennoc-Leslie Motor Co., 2007 W. Allegheny Ave., Philadelphia, Pa.								
	Model	2½	4-4⅛x5½	Buda	27.2	144	36x5	36x7	2,895
Reo	Reo Motor Car Co., Lansing, Mich.								
	Model F	¾	4-4⅛x4⅛	Own	27.2	128	34x4½P	34x4½P	1,275
Republic	Republic Motor Truck Co., Alma, Mich.								
	Model Dispatch	¾	4-3¼x5	Own	16.9	110	32x3P	32x3½	1,095
	Model Special	¾	4-3¼x5	Own	16.9	128	32x3P	32x4	1,295
	Model 10	1	4-3½x5	Continental	19.6	124	34x3	34x4	1,485
	Model 11	1½	4-3¾x5	Continental	22.5	144	34x3½	34x5	1,775
	Model 12	2	4-4⅛x5½	Buda	27.2	144	34x4	34x6	2,150
	Model T	3½	4-4¼x6	Buda	29.0	165	36x5	36x5D	3,450
	Model V	5	4-4½x6	Own	32.4	160	36x5	40x6D	4,500
Riker	Locomobile Co. of America, 1 S. Main St., Bridgeport, Conn.								
	Model	3	4-4¼x6	Own	28.9	170, 190	36x5	36x5D	.....
	Model	4	4-4¼x6	Own	28.9	170, 190	36x5	36x5D	.....
Rock Falls See page 203	**Rock Falls Mfg. Co. Sterling, Ill.**								
	Model 9 lbs.	**2500**	**8-3¼x5**	**Herschell-Spill.**	**33.8**	**150**	**35x5**	**35x5**	.....
	Model 10 lbs.	**2500**	**8-3¼x5**	**Herschell-Spill.**	**33.8**	**132**	**35x5**	**35x5**	.....
Rowe See page 43	**Rowe Motor Mfg. Co., Lancaster, Pa.**								
	Model C D W	**2**	**4-4 x5**	**Wisconsin**	**25.6**	**142**	**34x4**	**36x3½D**	**3,000**
	Model C D W	**2½**	**4-4 x5**	**Wisconsin**	**25.6**	**164**	**34x4**	**36x4D**	**3,250**
	Model D E W	**3½**	**4-4 x6**	**Wisconsin**	**25.6**	**156**	**36x5**	**36x5D**	**3,800**
	Model FW	**5**	**4-4¾x5½**	**Wisconsin**	**36.1**	**168**	**36x6**	**40x6D**	**4,900**
Sandow	Sandow Motor Truck Co., 3333 N. Grand Ave., Chicago, Ill.								
	Model G	1	4-3½x5	Continental	19.6	120	34x3½	34x5	$2,050
	Model H	1½	4-3½x5	Continental	19.6	138	34x4	34x6	2,550
	Model J	2	4-4⅛x5½	Continental	27.2	165	36x4	36x7	3,250
	Model K	3½	4-4½x5½	Continental	32.4	175	36x5	36x5D	4,250
Sanford See page 53	**Sanford Motor Truck Co., Syracuse, N. Y.**								
	Model W25	**2½**	**4-4⅛x5¼**	**Continental**	**27.2**	**156**	**36x4**	**36x4D**	**3,000**
	Model W35	**3½**	**4-4½x5½**	**Continental**	**32.4**	**174**	**36x5**	**36x5D**	**3,800**
	Model W50	**5**	**4-4½x5½**	**Continental**	**32.4**	**174**	**36x5**	**40x6D**	**4,600**
Schacht	Schacht Motor Truck Co., Gest & Evans Sts., Cincinnati, Ohio.								
	Model	2	4-4¼x5½	Buda	28.9	144	36x7½	36x7	3,150
	Model	2½	4-4¼x5½	Buda	28.9	156	36x4	36x4D	3,500
	Model	3½	4-4¼x5½	Buda	28.9	168	36x5	36x5D	3,950
	Model	5	4-4¼x5½	Buda	28.9	168	36x5	40x6D	4,950
Selden See page 47	**Selden Truck Sales Co., Rochester N. Y.**								
	Model T X R	**1**	**4-3½x5**	**Continental**	**19.6**	**140**	**34x3½**	**34x5**	**1,900**
	Model T W L	**1**	**4-3½x5**	**Continental**	**19.6**	**130, 140**	**34x3½**	**34x5**	**2,100**
	Model J C B	**2**	**4-4⅛x5¼**	**Continental**	**27.2**	**150**	**36x4**	**36x7**	**2,750**
	Model J W B	**2**	**4-4⅛x5¼**	**Continental**	**27.2**	**150**	**36x4**	**36x7**	**2,950**
	Model N L	**3½**	**4-4½x5½**	**Continental**	**32.4**	**164**	**36x5**	**36x5D**	**3,650**
	Model D L	**5**	**4-4½x5½**	**Continental**	**32.4**	**170**	**36x6**	**40x12**	**4,950**

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United Trucks

Worm Drive

1½ Ton

2½ Ton

3½ Ton

5 Ton

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U. S. A.

Move Quick

Write at once and if your territory is open secure the agency for the Acme Auto Truck.

The line is one of infinite possibilities for live dealers—every item of the specifications is a universally advertised standard article.

No missionary work required but you'll have to write at once.

Back of the truck is a strong financial organization.

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A Perfect Balanced Truck

Sanford Trucks

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"Hauls Everywhere"

The complete line of "Hall Trucks" will meet every requirement and satisfy every preference. From motor to wheels every part is made by a manufacturer of national reputation.

2-ton Worm Drive Chassis.
3½-ton Worm Drive Chassis
5-ton Worm Drive Chassis
5 to 7-ton Double Side Chain Chassis
Bodies fo all kinds for all purposes.

Send for catalog of complete line of trucks.

Lewis-Hall Iron Works

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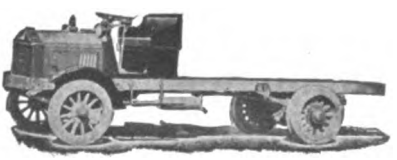

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Gasoline Commercial Vehicles—(Continued)

Brief Specifications, Prices and Names and Addresses of Manufacturers

Model No. or Name	Manufacturer's Name and Address	Load Capacity, Tons	No. of Cylinders, Bore and Stroke of Motor	Make of Motor	N.A.C.C. H.P.	Wheelbase	Size of Tires Front	Size of Tires Rear	Price
Seneca **See page 51**	**Seneca Motor Car Co., Fostoria, Ohio.**								
	Model F	½	4-3⅛x4½	LeRoi	15.6	108	30x3½P	30x3½P	900
Service	Service Motor Truck Co., Wabash, Ind.								
	Model 220	1	4-3⅛x5¼	Buda	19.6	137	34x4	34x4	1,900
	Model 240	2	4-4¼x5½	Buda	28.9	160	36x4	36x7	2,750
	Model 270	3½	4-4¼x5½	Buda	28.9	171	36x5	36x5D	3,600
	Model 275	3½	4-4½x6	Buda	32.4	171	36x5	36x5D	3,900
	Model 300	5	4-4½x6	Buda	32.4	171	36x6	36x6D	4,600
Southern	Southern Truck & Car Corp., Greensboro, N. C.								
	Model	1	4-3½x5	Lycoming	19.6	130	34x4	34x4	1,295
	Model	1½	4-3½x5	Lycoming	19.6	130	34x3½	34x5	1,695
Standard	Standard Motor Truck Co., 315 Bellevue Ave., Detroit, Mich.								
	Model 70	2	4-4⅛x5¼	Continental	27.2	140	36x4	36x6	2,800
	Model 65	3½	4-4½x5½	Continental	32.4	146	36x6	36x5	3,675
	Model 85	5	4-4½x5½	Continental	32.4	146	36x6	40x6D	4,650
Star	Star Carriage Co., Seattle, Wash.								
	Model W	2	4-4⅛x5	Continental	27.2	170	34x4	36x7	2,950
States	States Motor Car Co., Kalamazoo, Mich.								
	Model B T	½	4-3¾x4¼	G. B. & S.	22.5	112	32x4P	32x4P	650
Steele	Steele W. M., Worcester, Mass.								
	Model C	2	4-4⅛x5¼	Continental	27.2	115	38x5	40x4D	2,250
	Model B	3	4-5 x5	Own	40.0	127	38x6	40x5D	3,000
	Model B A	4	4-5 x5	Own	40.0	127	38x6	40x5D	3,500
	Model A	5	4-5 x5	Own	40.0	127	38x7	40x5D	4,000
Sterling	Sterling Motor Truck Co., 46th Ave. and Rogers St. (W. Allis), Milwaukee, Wis.								
	Model	2½	4-4¼x5¾	Own	28.9	156	36x4	36x4D	2,950
	Model	3½	4-4¼x6¾	Own	28.9	162	36x5	40x5D	4,250
	Model	5	4-4¾x6¾	Own	36.1	168	36x6	40x6D	5,000
	Model	7	4-4¾x6¾	Own	36.1	168	36x6	40x7D	5,500
Stewart **See page 43**	**Stewart Motor Corp., Buffalo, N. Y.**								
	Model 6	¾	4-3⅛x4½	LeRoi	15.6	110	32x4P	32x4P	950
	Model 7	2	4-4⅛x5¼	Continental	27.2	156 174	34x4	34x4D	2,575
	Model 8	1	4-3½x5	Continental	19.6	130	34x3½	34x4	1,575
	Model 9	1½	4-3¾x5	Continental	22.5	140	34x3½	34x5	1,975
Studebaker	Studebaker Corp. of America, Bronson and Main Sts., South Bend, Ind.								
	Model S. F	½	4-3⅞x5	Own	24.0	112	35x4½P	35x4½P	1,045
	Model 7	1	4-3⅞x5	Own	24.0	125	35x5P	35x5P	1,400
Sullivan	Sullivan Motor Truck Corp., Rochester, N. Y.								
	Model F	1½	4-3¾x4½	Buda	22.5	129	36x3	36x5	$2,350
	Model E	2	4-4⅛x5½	Buda	27.2	150 168	36x4	36x6	2,850
Superior	Superior Motor Truck Co., Atlanta, Ga.								
	Model A	1	4-3½x5	Own	19.6	124	34x4½P	34x4	1,500
	Model C	2	4-3¾x5	Own	22.5	144	36x4	36x6	2,000
T. R. M.	Tegetmeier & Riepe Co., 771-73 First Ave., New York City.								
	Model A	1½	4-4⅛x5¼	Continental	27.2	144	36x3½	36x5	2,600
	Model C	2	4-4⅛x5¼	Continental	27.2	144 162	36x4	36x4D	2,800
	Tegetmeier & Riepe Co.—See T. R. M.								
n	Tiffin Wagon Co., Tiffin, Ohio.								
	Model G W	1½	4-3¾x5¼	Continental	22.5	135	36x3½	36x5	1,970
	Model M W	2½	4-4⅛x5¼	Continental	27.2	148	36x4	36x3½D	2,700
	Model P W	3½	4-4½x5½	Continental	32.4	160	36x5	36x5D	3,500
	Model R W	5	6-3¾x5¼	Continental	33.7	168	36x5	36x5D	4,550
Titan	Titan Truck Co., 25th St. and St. Paul Ave. Milwaukee, Wis.								
	Model	3½	4-4½x6	Buda	32.4	162	36x5	40x5D	4,300
	Model	5	4-4½x6	Buda	32.4	156	36x6	40x6D	5,150
	Model	6	4-4½x6	Buda	32.4	156	36x6	40x6D	5,150

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MOTOR TRUCKS

PERFORMANCE
IT'S PROOF OF PERFECTION

The MUSKEGON is made up of the very best Standard Quality Units, assembled to bring about a most efficient, durable and easily operated truck.

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AN interpretation of speed vastly more important than fast running wheels. It is speed commercialized. Speed that *means more business.*

1¼ TON SPEED TRUCK on Pneumatic Tires

COLLIER TRUCKS

Every part and feature of construction has been co-ordinated to the single purpose of making this truck a rapid and efficient worker with a wide range of adaptability. It is perfectly suited to the hurry up Special Delivery or the transportation of good sized load with extraordinary dispatch.

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BESSEMER TRUCKS

Bessemer trucks give your customers big value for their money. They are unusually sturdy, powerful and economical to operate. That is the secret of their big and growing sales.

The convenient size and the remarkably efficient service given by the Model G 1-Ton, Internal Gear Drive Truck assured its success from the start. Specifications 8¼" bore by 5" stroke, Continental Motor, Zenith Carburetor, Torbenson Internal Gear rear axle, thermo-syphon cooling, combination splash and force feed lubrication, multiple-disc clutch, vertical tube radiator, 124" wheelbase.

Larger Models

Model G	—Internal Gear	—1 ton
Model H	—Internal Gear	—1½ ton
Model J	—Internal Gear	—2 ton
Model K	—Internal Gear	—3½ ton

These four models, each supreme in its particular field, make the Bessemer line produce big profits for dealers. Write us for territory.

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Grove City, Penna.

Maxwell

MORE MILES ON TIRES

MORE MILES PER GALLON

Maxwell Motor Sales Corp.
Detroit, Mich.

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Gasoline Commercial Vehicles—(Continued)

Brief Specifications, Prices and Names and Addresses of Manufacturers

Model No. or Name	Manufacturer's Name and Address	Load Capacity, Tons	No. of Cylinders, Bore and Stroke of Motor	Make of Motor	N.A.C.C. H.P.	Wheelbase	Size of Tires Front	Size of Tires Rear	Price
Tower	Tower Motor Truck Co., W. Grove St., Greenville, Mich.								
	Model F	2	4-4 1/8x5 1/4	Continental	27.2	146	36x4	36x7	$2,750
Traffic	Traffic Motor Truck Corp., 3807-19 Laclede Ave., St. Louis, Mo.								
	Model T	2	4-3 1/2x5	Gray	19.6	133	34x3	34x4	1,195
Triangle	Triangle Motor Truck Co., St. Johns, Mich.								
	Model A	1 1/2	4-3 3/4x5 1/4	Waukesha	22.5	144	34x3 1/2	34x6	2,185
	Turnbull Motor Truck & Wagon Co.—See Defiance.								
	Twin City Four Wheel Drive Co.—See Ware.								
	United Four Wheel Drive Truck Corp.—See Allfour.								
U. S.	United States Motor Truck Co., Covington, Ky.								
	Model E	2 1/2	4-4 1/8x5 1/4	Continental	27.2	144 168	34x4	36x4D	2,800
	Model H	2 1/2	4-4 1/8x5 1/4	Continental	27.2	144 168	34x4	36x4D	3,270
	Model D	3 1/2	4-4 1/2x5 1/2	Continental	32.4	144 162 174	36x5	36x5D	3,500
	Model J	3 1/2	4-4 1/2x5 1/2	Continental	32.4	144 162 174	36x5	36x5D	3,950
	Model K	5	4-4 3/4x6 3/4	Waukesha	36.1	150 168 186	36x5	40x6D	4,850
United **See page 53**	**United Motors Co., Grand Rapids, Mich.**								
	Model A X	**1 1/2**	**4-3 3/4x5 1/2**	**Buda**	**22.5**	**133**	**34x3 1/2**	**34x6**	**2,600**
	Model B X	**2 1/2**	**4-4 1/4x5 1/2**	**Buda**	**28.9**	**148**	**36x4**	**36x7**	**3,300**
	Model C X	**3 1/2**	**4-4 1/2x6**	**Buda**	**32.4**	**160**	**36x5**	**36x5D**	**3,900**
	Model V X	**5**	**4-4 1/2x6**	**Buda**	**32.4**	**160**	**36x5**	**40x6D**	**4,750**
Universal	Universal Service Co., Detroit, Mich.								
	Model L	3 1/2	4-4 1/2x5 1/2	Continental	32.4	156	36x5	36x5D	3,700
	Model D	2	4-4 x5 1/2	Universal	25.6	132	36x4	36x4D	2,800
	Model C	1 1/2	4-3 3/4x5	Universal	22.5	130	34x3 1/2	34x5	1,950
Velie	Velie Motors Corp., Third Ave. and Third St., Moline, Ill.								
	Model 25B	2	4-4 1/8x5 1/4	Continental	27.2	135 140	36x4	36x7	2,950
	Model 26B	3 1/2	4-4 1/2x5 1/2	Continental	32.4	148 172	36x5	36x5D	3,900
Victor **See page 51**	**Ghent Motor Car Co., Ottawa, Ill.**								
	Model A	**1 1/2**	**4-3 1/2x4 1/2**	**Light**	**16.9**	**130**	**32x3 1/2**	**32x5**	**1,250**
Victor **See page 49**	**Victor Motor Truck & Trailer Co., 401 N. Hoyne Ave., Chicago, Ill.**								
	Model L	**2**	**4-4 1/8x5 1/4**	**Continental**	**27.2**	**166**	**36x4**	**36x6**	....
	Model M	**3 1/2**	**4-4 1/2x5 1/2**	**Continental**	**32.4**	**172**	**36x6**	**36x6D**	....
Vim	Vim Motor Truck Co., 23rd and Market Sts., Philadelphia, Pa.								
	Model 21	1/2	4-3 x4 1/2	Own	14.4	108	31x4P	31x4P	945
	Model 25	1	4-3 3/4x5	Continental	22.5	120	34x4 1/2	34x4 1/2	1,895
	Model 22	2	4-3 3/4x5 1/8	Hercules	22.5	142	36x4	36x6	3,150
	Model 23	3	4-4 1/4x5 1/2		28.9	175	36x4	36x4	3,950
Walter	Milwaukee Locomotive Mfg. Co., Ft. Belleview Pl., Milwaukee, Wis.	3	4-4 3/8x6	Own	30.6	108	40x4	40x4	....
Walter	Walter Motor Truck Co., 110 West End Ave., New York, N. Y.								
	Model FWD	5	4-4 1/2x6 1/2	Own	32.4	140	36x7	40x7 D	5,500
Ware	Twin City Four Wheel Drive Co., 2482-96 University Ave., St. Paul, Minn.								
	Model B	3 1/2	4-5 1/8x6	Wisconsin	42.0	140	36x6	36x6	4,750
	Model A	5	4-5 1/8x6 1/2	Wisconsin	42.0	140	36x7	36x7	5,250
Watson	Watson Wagon Co. 214 W. Center St., Canastota, N. Y.	5	4 1/2x5 1/2	Continental	32.4	80	34x4	36x5 D	4,050

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It pays to **sell** D-E Worm-Drive Trucks because they are hundreds of dollars **less** than all others of same carrying capacity. It pays to **buy** them because they represent **the greatest value** at their prices in America! The weights given on the right are the weights of the chassis **including weight of body.**

Model J 2250 Pounds $1045	Model C 7000 Pounds $2750
Model A 3500 Pounds $1775	Model D 5500 Pounds $2150
Model B 4500 Pounds $2075	Model E 14,000 Pounds $4500

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Gasoline Commercial Vehicles—(Continued)

Brief Specifications, Prices and Names and Addresses of Manufacturers

Model No. or Name	Manufacturer's Name and Address	Load Capacity, Tons	No. of Cylinders, Bore and Stroke of Motor	Make of Motor	N.A.C.C. H.P.	Wheelbase	Size of Tires Front	Size of Tires Rear	Price
Western	Western Truck Mfg. Co., 122 N. Curtis St., Chicago, Ill.								
	Model C	2	4-4⅛x5¼	Continental	27.2	146	36x4	36x6	$2,400
	Model F	3	4-4⅛x5¼	Continental	27.2	158	36x4	36x7	2,800
	Model T	7	4-4¾x5½	Wisconsin	36.1	146	36x6	40x7D	5,000
White	White Co., 842 E. 79th St., Cleveland, Ohio. Model G B B E	¾	4-3¾x5⅛	Own	22.5	133½	34x4½P	34x4½P	2,300
	Model T B C	2	4-3¾x5⅛	Own	22.5	157½	36x4½	36x4½D	3,300
	Model T A D	3	4-3¾x5⅛	Own	22.5	163	36x5	40x5D	4,100
	Model T C D	5	4-4¼x6⅜	Own	28.9	169	36x5	40x6D	5,000
White Hickory	White Hickory Wagon Mfg. Co., Atlanta, Ga. Model F	1	4-3¾x5	Continental	22.5	144	36x3½	36x4	.....
	Model H	1½	4-3¾x5	Continental	22.5	144	36x3½	36x5	.....
Wichita	Wichita Falls Motor Co., Wichita Falls, Texas. Model K	1	4-3½x5	Own	19.6	118 144	36x3	36x4	1 800
	Model L	1½	4-3½x5	Own	19.6	118 114	36x3½	36x5	2,100
	Model M	2	4-4¾x5¼	Own	36.1	118 114	36x3½	36x6	2,500
	Model R	2½	4-4¾x5¼	Own	36.1	144	36x4	36x7	2,700
	Model O	3½	4-4¼x5¾	Own	28.9	165	36x5	36x5D	3,600
	Model Q	5	4-4¼x5	Own	28.9	165	38x6	38x6D	4,300
	Willys-Overland, Inc.—See Overland.								
Wilson	Wilson Co., J. C., 15th and Warren Aves., Detroit, Mich. Model	1	4-3½x5	Continental	19.6	124	35x5P	35x5P	$1,630
	Model	2	4-4⅛x5¼	Continental	27.2	144	36x4	36x4D	2,800
	Model	3½	4-4½x5½	Continental	32.4	160	36x5	36x5D	3,800
	Model	5	.....	.....	.....	.....	36x6	40x6D	4,600
Winther	Winther Motor Truck Co., Winthrop Harbor, Ill. Model 38	1½	4-3¾x5	Wisconsin	16.9	132	34x3½	34x5	2,250
	Model 48	2	4-4 x6	Wisconsin	25.6	150	36x4	36x4D	3,000
	Model 68	3	4-4 x6	Wisconsin	25.6	150	36x5	36x5D	3,800
	Model 88	4	4-4¼x6	Wisconsin	28.9	156	36x5	40x5D	4,200
	Model 108	5	4-4¾x5½	Wisconsin	36.1	162	36x5	40x6D	5,000
	Model 128	6	4-5⅛x6	Wisconsin	42.0	162	36x6	40x12	5,250
	Model 148	7	4-5¾x6	Wisconsin	42.0	162	36x6	40x7D	5,500
	Model 438	1½	4-3¾x5	.....	22.5	132	34x4	34x4	1,995
	Model 448	2	4-4 x6	.....	25.	158	36x4	36x4D	3,500
	Model 468	3	4-4¼x6	.....	28.9	158	36x6	36x5D	4,500
	Model 488	4	4-4¼x6	.....	28.9	164	36x6	40x5D	5,000
	Model 4108	5	4-4¾x5½	.....	36.1	170	36x6	40x6D	5,850
	Model 4128	6	4-5⅛x6	.....	42.0	170	36x6	40x6D	6,250
	Model 4148	7	4-x5⅛6	.....	42.0	170	36x6	40x7D	6,500
W. D	Witt Will Co., Washington, D. C. Model 18	2	4-4⅛x5¼	Continental	27.2	144	36x3½	36x3½D	2,850
Wolverine See page 45	American Commercial Car Co., Detroit Mich. Model (See also American.)	1½	4-3¾x5	Continental	22.5	140	34x3½	34x5	2,180

Electric Commercial Vehicles

Brief Specifications, Prices and Names and Addresses of Manufacturers

Model No. or Name	Manufacturer's Name and Address	Load Capacity Tons	Make of Battery	Wheel Base	Size of Tires Front	Size of Tires Rear	Chassis Price
C. T	Commercial Truck Co. of America, 27th and Brown Sts., Philadelphia, Pa.						
	Model	½	Opt	89¼	3x36	3x36	$1,750
	Model	1	Opt	101	3½x36	4x36	2,100
	Model	2	Opt	116	4x36	4x36D	2,500
	Model	3	Opt	122	3½x36D	4x36D	3,650
	Model	5	Opt	312	4x36D	5x36D	4,150

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Electric Commercial Vehicles—(Continued)

Brief Specifications, Prices and Names and Addresses of Manufacturers

Model No. Name	Manufacturer's Name and Address	Load Capacity Tons	Make of Battery	Wheel Base	Size of Tires Front	Size of Tires Rear	Chassis Price
	Covel Mfg. Co.—See Ross.						
Ehrlich	Ehrlich Electric Construction Co., Chicago, Ill.						
	Model 1002A	1	Edison	94	36x3	36x3½	.....
	Model 1002D	1½	Edison	108	36x4	36x5	.....
	Model 1002G	2	Edison	120	36x5	36x6	.....
	Model 1002F	3	Edison	120	36x6	36x7	.....
Walker	Walker Vehicle Co., Chicago, Ill.						
	Model M	½	Edison	93	34x3	36x3½	.....
	Model K	1	Edison	96	34x3½	36x4	.....
	Model L	2	Edison	110	38x4	38x6	.....
	Model P	3½	Edison	131	36x5	38x5D	.....
	Model N	5	Edison	144	36x7	38x6D	.....
Ward	Ward Motor Vehicle Co., S. Fulton Ave., Mt. Vernon, N. Y. Model Special	⅜	Opt.	88	32x3	32x3	.....
	Model W-A	½	Opt.	90	32x3	32x4	.....
	Model W-B	1	Opt.	102	32x4	36x5	.....
	Model W-D	2	Opt.	114	36x5	36x7	.....
	Model W-F	3½	Opt.	132	36x6	40x10	.....
	Model W-H	5	Opt.	144	36x7	40x12	.....

Steam Commercial Vehicles

Brief Specifications, Prices and Names and Addresses of Manufacturers

Model No. or Name	Manufacturer's Name and Address	Load Capacity, Tons	H.P.	Wheel-base	Size of Tires Front	Size of Tires Rear	Price
Doble-Detroit	Doble-Detroit Steam Motors Co., 75 W. Congress St., Detroit, Mich	2	45	144	36x4	36x6	....
Doble 2A	Doble Laboratories, 350 Folsom St., San Francisco, Cal.	2	35	144 156 168	36x4	36x7	....

Tractors

Brief Specifications, Prices and Names and Addresses of Manufacturers

Model No. or Name	Manufacturer's Name and Address	Type of Traction	Make of Motor	No. of Cylinders Bore and Stroke of Motor	N.A.C.C. H.P.	Fuel	Price
Acme	Acme Harvesting Machine Co., Peoria, Ill	Wheel	Beaver	4-4½x6	32.4	Gasoline Kerosene Distillate	$1800 2250
Advance-Rumely 8-16	Advance-Rumely Thresher Co., Madison St. and Lincoln Way, LaPorte, Ind	Wheel	Own	4-4x5½	25.6	Kerosene	....
Advance-Rumely Oil Pull 14.28	Advance-Rumely Thresher Co., Madison St. and Lincoln Way, LaPorte, Ind	Wheel	Own	2-7x8½	39.2	Kerosene Distillate	....
Advance-Rumely Oil Pull 18.35	Advance-Rumely Thresher Co. Madison St. and Lincoln Way, LaPorte, Ind	Wheel	Own	1-10x12		Kerosene Distillate	3000
Advance-Rumely Oil Pull 36.60	Advance-Rumely Thresher Co., Madison St. and Lincoln Way, LaPorte, Ind	Wheel	Own	2-10x12	16.0	Kerosene Distillate	4300
Allis-Chalmers 10-18	Allis-Chalmers Mfg. Co., Milwaukee, Wis	Wheel	Own	2-5¼x7	22.1	Kerosene Gasoline	1250
Allwork	Electric Wheel Co., Walton Heights, Quincy, Ill.	Wheel	Own	4-5 x6	40.0	Kerosene	1460
American	American Engine & Tractor Co., Charles City, Iowa	.....	Beaver	4-4¾x6	36.1	Gasoline Kerosene	1895
	American Tractor Corp.—See Yankee.						
Andrews	Andrews Tractor Co., 2529 University Ave., S. E., Minneapolis, Minn	Wheel	Veerac	4-4 x5	25.6	Gasoline	1000

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Tractors—(Continued)

Brief Specifications, Prices and Names and Addresses of Manufacturers

Model No. or Name	Manufacturer's Name and Address	Type of Traction	Make of Motor	No. of Cylinders Bore and Stroke of Motor	N.A.C.C. H.P.	Fuel	Price
Appleton	Appleton Mfg. Co., Batavia, Ill.	Wheel	Buda	4-4¼x5½	27.2	Gasoline Kerosene	....
Atlas	Midwest Engine Co. 19th St. and Martindale Ave., Indianapolis, Ind.	Wheel	Waukesha	4-4¼x5¾	28.9	Gasoline Kerosene	$1565
	Avery & Sons, B. F.—See Louisville.						
Aulson	Aulson Tractor Co., Waukegan, Ill.	Wheel	Climax	4-5 x6½	40.0	Gasoline Kerosene	....
Autohorse	One Wheel Truck Co. 2122 Chouteau Ave. St. Louis, Mo.	Wheel	Continental	4-3¾x5	22.5	Gasoline	2100
Avery B-5-10	Avery Co., 2300 N. Adams St., Peoria, Ill.	Wheel	Own	4-3 x4	14.4	Gasoline Kerosene	....
Avery 8-16	Avery Co., 2300 N. Adams St., Peoria, Ill.	Wheel	Own	2-5½x6	24.2	Gasoline Kerosene Distillate	...
Avery 12-25	Avery Co., 2300 N. Adams St., Peoria, Ill.	Wheel	Own	2-6½x7	33.8	Gasoline Kerosene Distillate	....
Avery 18-36	Avery Co., 2300 N. Adams St., Peoria, Ill.	Wheel	Own	4-5½x6	48.4	Gasoline Kerosene Distillate	...
Avery 25-50	Avery Co., 2300 N. Adams St. Peoria, Ill.	Wheel	Own	4-6½x7	67.6	Gasoline Kerosene Distillate	....
Avery 40-80	Avery Co., 2300 N. Adams St., Peoria, Ill.	Wheel	Own	4-1¾x8	96.8	Gasoline Kerosene Distillate	....
Bates Steel-Mule	Joliet Oil Tractor Co., Joliet, Ill.	Crawler	Erd	4-4 x6	25.6	Kerosene	....
Bean Track Pull	Bean Spray Pump Co., San Jose, Cal.	Crawler	LeRoi	4-3⅛x4½	15.6	Gasoline Distillate	1340
Beeman F	Beeman Garden Tractor Co., Minneapolis, Minn.	Wheel	Own	1-3½x4½	4.9	Gasoline	285
Beltrail B	Beltrail Tractor Co., 2237 Hampden Ave., St. Paul, Minn.	Crawler	Waukesha	4-3¾x5¼	22.5	Gasoline Distillate	1600
Besser	Besser Mfg. Co., Alpena, Mich.	Wheel	Beaver	4-4½x6	32.4	Kerosene	1895
Best 75	Best Gas Traction Co., C. L., San Leandro, Cal.	Crawler	Own	4-7¾x9	96.2	Distillate	5750
Best 40	Best Gas Traction Co., C. L., San Leandro, Cal.	Crawler	Own	4-6¼x6¼	62.1	Distillate	4100
Biltwel	Velie Motors Corp., Third Ave. and Third St., Moline, Ill.	Wheel	Own	4-4 x5½	40.0	Kerosene	1550
Blumberg Steady Pull	Blumberg Motor Mfg. Co., San Antonio, Texas	Wheel	Own	4-3¾x5	22.5	Gasoline Coal oil	1200
Blumberg Steady Pull	Blumberg Motor Mfg. Co., San Antonio, Texas	Wheel	Own	4-3¾x5¾	22.5	Gasoline Coal oil	800
Boring	Boring Tractor Corp., 659 Race St., Rockford, Ill.	Wheel	Waukesha	4-4¼x5¾	28.9	Gasoline Kerosene	1485
Brillion	Brillion Iron Works, Brillion, Wis.	Wheel	Field	4-3¾x5	22.5	Kerosene	....
	Buckeye Mfg. Co.—See Trundaar.						
Bullock	Bullock Tractor Co., Chicago, Ill.	Crawler	Waukesha	4-4¾x6¾	36.1	Gasoline Kerosene	2000
Bullock Jr.	Bullock Tractor Co., Chicago, Ill.	Crawler	Minneapolis	4-5 x7	40.0	Gasoline Kerosene	4500
C. O. D.	C. O. D. Tractor Co., Minneapolis, Minn.	Wheel	Own	2-6½x7	43.8	Kerosene	1395
Capital	Dissinger & Bro. Co., C. H. A., Fourth and Vine Sts., Wrightsville, Pa.	Wheel	Own	2-7½x12	45.0	Coal oil	1400
Capital	Dissinger & Bro. Co., C. H. A., Fourth and Vine Sts., Wrightsville, Pa.	Wheel	Own	4-6 x12	38.4	Coal oil	1600
Case 10-18	Case T. M. Co., J. I., State and Douglas Sts., Racine, Wis.	4-Wheel	Own	4-3⅞x5	24.0	Gasoline Kerosene Distillate	1225
Case 10-20	Case T. M. Co., J. I., State and Douglas Sts., Racine, Wis.	Wheel	Own	4-4¼x6	28.9	Gasoline Kerosene Distillate	1325
Caterpillar 75	Holt Manufacturing Co., Stockton, Cal.	Crawler	Own	4-7½x8	90.0	Distillate	...
Caterpillar 45	Holt Manufacturing Co., Stockton, Cal.	Crawler	Own	4-6 x7	57.6	Distillate	..

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Tractors—(Continued)

Brief Specifications, Prices and Names and Addresses of Manufacturers

Model No. or Name	Manufacturer's Name and Address	Type of Traction	Make of Motor	No. of Cylinders Bore and Stroke of Motor	N.A.C.C. H.P.	Fuel	Price
Chase 9-18	Chase Motor Truck Co., 332 S. West St., Syracuse, N. Y.	Wheel	Buda	4-3¾x5½	22.5	Gasoline Kerosene	$1200
Cleveland	Cleveland Tractor Co., Lamb and Euclid Aves., Cleveland, Ohio	Crawler	Weidely	4-3¾x5½	22.5	Gasoline Kerosene Distillate	1385
Coleman	Coleman Tractor Corp., Kansas City, Mo	Wheel	Climax	4-5 x6½	40.0	Kerosene	1450
	Columbus Tractor Co.—See Farmer Boy.						
Common Sense	Common Sense Gas Tractor Co., Minneapolis, Minn	Wheel	Her. hell Sj ill	3-3¼x5	33.8	Gasoline	2200
Craig	Craig Tractor Co., Bliss Rd., Cleveland, Ohio	Wheel	Beaver	4-4½x6	32.4	Kerosene	....
Dart Blue J.	Dart Truck & Tractor Corp., Waterloo, Iowa	Wheel	Buda	4-4¼x5½	28.9	Gasoline	1750
	Dauch Mfg. Co.—See Sandusky.						
	Dayton-Dick Co.—See Leader.						
Depue A	Depue Brothers Mfg. Co., Clark Bldg., Clinton, Iowa	Wheel	Buda	4-4½x6	32.4	Gasoline	2500
	Dessinger & Bro. Co., C. H. A.—See Capital.						
Dill	Dill Tractor Mfg. Co., G. I., Harrisburg, Ark	Wheel	Continental	4-4½x5½	32.4	Gasoline	2480
	Elderfields Reservation.—See Universal.						
	Electric Wheel Co.—See Allwork.						
E. B. 9-16	Emerson-Brantingham Implement Co., 1652 N. Iron St., Rockford, Ill	Wheel	Own	4-4⅛x4½	27.2	Kerosene	....
E. B. 12-20	Emerson-Brantingham Implement Co., 1652 N. Iron St., Rockford, Ill	Wheel	Own	4-4¾x5	36.1	Kerosene	....
E. B. 12-20 AA	Emerson-Brantingham Implement Co. 1652 N. Iron St. Rockford Ill	Wheel	Own	.....	.....	.....	....
E. B. 20-35	Emerson-Brantingham Implement Co. 1652 N. Iron St. Rockford Ill	Wheel	Own	4-5 x7	40.0	Kerosene	....
E. B. R40-65	Emerson-Brantingham Implement Co. 1652 N. Iron St. Rockford Ill	Wheel	Own	4-7¼x9	84.1	Kerosene	....
Eagle F12-22	Eagle Mfg. Co., Winnebago and Drew Sts., Appleton, Wis	Wheel	Own	2-7 x8	39.6	Kerosene	1496
Eagle F16-30	Eagle Mfg. Co., Winnebago and Drew Sts., Appleton, Wis	Wheel	Own	2-8 x8	51.5	Kerosene	1827
Elgin	Elgin Tractor Corp., Piqua, Ohio	Wheel	Rutenber	4-4⅛x5½	27.2	Gasoline Kerosene	1385
	Evans Mfg. Co.—See Hudson.						
Fageol	Fageol Motors Co., 107th Ave. and Hollywood Blvd., Oakland, Cal	Wheel	.....	4-3⅜x5	18.2	Gasoline Kerosene	1500
Farm Horse	Farm Horse Traction Works, Hartford, S. D	Wheel	Climax	4-5 x6½	40.0	Kerosene	1285
Farmer Boy	Columbus Tractor Co., 1908 W. Goodale St., Columbus, Ohio	Wheel	Waukesha	4-3¾x5¼	22.5	Gasoline Kerosene	1150
Fitch 3	Four Drive Tractor Co., 949 E. Maple St., Big Rapids, Mich	Wheel	Beaver	4-4¼x6	28.9	Kerosene	2500
	Ford & Son, Henry.—See Fordson.						
Fordson	Ford & Son, Henry, Dearborn, Mich	Wheel	Own	4-4 x5	25.6	Gasoline Kerosene	....
	Four Drive Tractor Co.—See Fitch.						
Frick	Frick Company, Waynesboro, Pa	Wheel	.....	4-4 x6	25.6	Kerosene	....
Fulton	Fulton Tractor Co., Anderson, Ind	Wheel	Waukesha	4-3½x5¼	19.6	Gasoline Kerosene	1275
Grain Belt G	Grain Belt Tractor Co., Fargo, N. D	Wheel	Waukesha	4-4¾x6¾	36.1	Gasoline Kerosene	2250
Gray 18-36	Gray Tractor Mfg. Co., 30th and University Aves., S. E., Minneapolis, Minn	Wheel	Waukesha	4-4¾x6¾	36.1	Gasoline Kerosene	2250
Hackney C	Hackney Mfg. Co., Prior St. and University Ave., St. Paul, Minn	Wheel	Field	4-3¾x5	22.5	Gasoline Kerosene	1250
Hackney 5	Hackney Mfg. Co., Prior St. and University Ave., St. Paul, Minn	Wheel	Climax	4-5 x6½	40.0	Gasoline Kerosene	1950

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Tractors—(Continued)

Brief Specifications, Prices and Names and Addresses of Manufacturers

Model No. or Name	Manufacturer's Name and Address	Type of Traction	Make of Motor	No. of Cylinders Bore and Stroke of Motor	N.A.C.C. H.P.	Fuel	Price
Appleton	Appleton Mfg. Co., Batavia, Ill.	Wheel	Buda	4-4¼x5½	27.2	Gasoline Kerosene	....
Atlas	Midwest Engine Co. 19th St. and Martindale Ave., Indianapolis, Ind.	Wheel	Waukesha	4-4¼x5¾	28.9	Gasoline Kerosene	$1565
	Avery & Sons, B. F.—See Louisville.						
Aulson	Aulson Tractor Co., Waukegan, Ill.	Wheel	Climax	4-5 x6½	40.0	Gasoline Kerosene	....
Autohorse	One Wheel Truck Co. 2122 Chouteau Ave. St. Louis, Mo.	Wheel	Continental	4-3¾x5	22.5	Gasoline	2100
Avery B-5-10	Avery Co., 2300 N. Adams St., Peoria, Ill.	Wheel	Own	4-3 x4	14.4	Gasoline Kerosene	....
Avery 8-16	Avery Co., 2300 N. Adams St., Peoria, Ill.	Wheel	Own	2-5½x6	24.2	Gasoline Kerosene Distillate	....
Avery 12-25	Avery Co., 2300 N. Adams St., Peoria, Ill.	Wheel	Own	2-6½x7	33.8	Gasoline Kerosene Distillate	....
Avery 18-36	Avery Co., 2300 N. Adams St., Peoria, Ill.	Wheel	Own	4-5½x6	48.4	Gasoline Kerosene Distillate	....
Avery 25-50	Avery Co., 2300 N. Adams St. Peoria, Ill.	Wheel	Own	4-6½x7	67.6	Gasoline Kerosene Distillate	....
Avery 40-80	Avery Co., 2300 N. Adams St., Peoria, Ill.	Wheel	Own	4-1¾x8	96.8	Gasoline Kerosene Distillate	....
Bates Steel-Mule	Joliet Oil Tractor Co., Joliet, Ill.	Crawler	Erd	4-4 x6	25.6	Kerosene	....
Bean Track Pull	Bean Spray Pump Co., San Jose, Cal.	Crawler	LeRoi	4-3⅛x4½	15.6	Gasoline Distillate	1340
Beeman F	Beeman Garden Tractor Co., Minneapolis, Minn.	Wheel	Own	1-3½x4½	4.9	Gasoline	285
Beltrail B	Beltrail Tractor Co., 2237 Hampden Ave., St. Paul, Minn.	Crawler	Waukesha	4-3¾x5¼	22.5	Gasoline Distillate	1600
Besser	Besser Mfg. Co., Alpena, Mich.	Wheel	Beaver	4-4½x6	32.4	Kerosene	1895
Best 75	Best Gas Traction Co., C. L., San Leandro, Cal.	Crawler	Own	4-7¾x9	96.2	Distillate	5750
Best 40	Best Gas Traction Co., C. L., San Leandro, Cal.	Crawler	Own	4-6¼x6¼	62.1	Distillate	4100
Biltwel	Velie Motors Corp., Third Ave. and Third St., Moline, Ill.	Wheel	Own	4-4 x5½	40.0	Kerosene	1550
Blumberg Steady Pull	Blumberg Motor Mfg. Co., San Antonio, Texas	Wheel	Own	4-3¾x5	22.5	Gasoline Coal oil	1200
Blumberg Steady Pull	Blumberg Motor Mfg. Co., San Antonio, Texas	Wheel	Own	4-3¾x5¾	22.5	Gasoline Coal oil	800
Boring	Boring Tractor Corp., 659 Race St., Rockford, Ill.	Wheel	Waukesha	4-4¼x5¾	28.9	Gasoline Kerosene	1485
Brillion	Brillion Iron Works, Brillion, Wis.	Wheel	Field	4-3¾x5	22.5	Kerosene	....
	Buckeye Mfg. Co.—See Trundaar.						
Bullock	Bullock Tractor Co., Chicago, Ill.	Crawler	Waukesha	4-4¾x6¾	36.1	Gasoline Kerosene	2000
Bullock Jr.	Bullock Tractor Co., Chicago, Ill.	Crawler	Minneapolis	4-5 x7	40.0	Gasoline Kerosene	4500
C. O. D.	C. O. D. Tractor Co., Minneapolis, Minn.	Wheel	Own	2-6½x7	43.8	Kerosene	1395
Capital	Dissinger & Bro. Co., C. H. A., Fourth and Vine Sts., Wrightsville, Pa.	Wheel	Own	2-7½x12	45.0	Coal oil	1400
Capital	Dissinger & Bro. Co., C. H. A., Fourth and Vine Sts., Wrightsville, Pa.	Wheel	Own	4-6 x12	38.4	Coal oil	1600
Case 10-18	Case T. M. Co., J. I., State and Douglas Sts., Racine, Wis.	4-Wheel	Own	4-3⅞x5	24.0	Gasoline Kerosene Distillate	1225
Case 10-20	Case T. M. Co., J. I., State and Douglas Sts., Racine, Wis.	Wheel	Own	4-4¼x6	28.9	Gasoline Kerosene Distillate	1325
Caterpillar 75	Holt Manufacturing Co., Stockton, Cal.	Crawler	Own	4-7½x8	90.0	Distillate	...
Caterpillar 45	Holt Manufacturing Co., Stockton, Cal.	Crawler	Own	4-6 x7	57.6	Distillate	...

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Tractors—(Continued)

Brief Specifications, Prices and Names and Addresses of Manufacturers

Model No. or Name	Manufacturer's Name and Address	Type of Traction	Make of Motor	No. of Cylinders Bore and Stroke of Motor	N.A.C.C. H.P.	Fuel	Price
Chase 9-18	Chase Motor Truck Co., 332 S. West St., Syracuse, N. Y.	Wheel	Buda	4-3¾x5½	22.5	Gasoline Kerosene	$1200
Cleveland	Cleveland Tractor Co., Lamb and Euclid Aves., Cleveland, Ohio	Crawler	Weidely	4-3¾x5½	22.5	Gasoline Kerosene Distillate	1385
Coleman	Coleman Tractor Corp., Kansas City, Mo	Wheel	Climax	4-5 x6½	40.0	Kerosene	1450
	Columbus Tractor Co.—See Farmer Boy.						
Common Sense	Common Sense Gas Tractor Co., Minneapolis, Minn	Wheel	Herschell Spill	3-3¼x5	33.8	Gasoline	2200
Craig	Craig Tractor Co., Bliss Rd., Cleveland, Ohio	Wheel	Beaver	4-4½x6	32.4	Kerosene	....
Dart Blue J.	Dart Truck & Tractor Corp., Waterloo, Iowa	Wheel	Buda	4-4¼x5½	28.9	Gasoline	1750
	Dauch Mfg. Co.—See Sandusky.						
	Dayton-Dick Co.—See Leader.						
Depue A	Depue Brothers Mfg. Co., Clark Bldg., Clinton, Iowa	Wheel	Buda	4-4½x6	32.4	Gasoline	2500
	Dessinger & Bro. Co., C. H. A.—See Capital.						
Dill	Dill Tractor Mfg. Co., G. I., Harrisburg, Ark	Wheel	Continental	4-4½x5½	32.4	Gasoline	2480
	Elderfields Reservation.—See Universal.						
	Electric Wheel Co.—See Allwork.						
E. B. 9-16	Emerson-Brantingham Implement Co., 1652 N. Iron St., Rockford, Ill	Wheel	Own	4-4⅛x4½	27.2	Kerosene	....
E. B. 12-20	Emerson-Brantingham Implement Co., 1652 N. Iron St., Rockford, Ill	Wheel	Own	4-4¾x5	36.1	Kerosene	....
E. B. 12-20 AA	Emerson-Brantingham Implement Co. 1652 N. Iron St. Rockford Ill	Wheel	Own	.....	.....	.....	....
E. B. 20-35	Emerson-Brantingham Implement Co. 1652 N. Iron St. Rockford Ill	Wheel	Own	4-5 x7	40.0	Kerosene	....
F. B. R40-65	Emerson-Brantingham Implement Co. 1652 N. Iron St. Rockford Ill	Wheel	Own	4-7¼x9	84.1	Kerosene	....
Eagle F12-22	Eagle Mfg. Co., Winnebago and Drew Sts., Appleton, Wis	Wheel	Own	2-7 x8	39.6	Kerosene	1496
Eagle F16-30	Eagle Mfg. Co., Winnebago and Drew Sts., Appleton, Wis	Wheel	Own	2-8 x8	51.5	Kerosene	1827
Elgin	Elgin Tractor Corp., Piqua, Ohio	Wheel	Rutenber	4-4⅛x5½	27.2	Gasoline Kerosene	1385
	Evans Mfg. Co.—See Hudson.						
Fageol	Fageol Motors Co., 107th Ave. and Hollywood Blvd., Oakland, Cal	Wheel	.....	4-3⅜x5	18.2	Gasoline Kerosene	1500
Farm Horse	Farm Horse Traction Works, Hartford, S. D	Wheel	Climax	4-5 x6½	40.0	Kerosene	1285
Farmer Boy	Columbus Tractor Co., 1908 W. Goodale St., Columbus, Ohio	Wheel	Waukesha	4-3¾x5¼	22.5	Gasoline Kerosene	1150
Fitch 3	Four Drive Tractor Co., 949 E. Maple St., Big Rapids, Mich	Wheel	Beaver	4-4¼x6	28.9	Kerosene	2500
	Ford & Son, Henry.—See Fordson.						
Fordson	Ford & Son, Henry, Dearborn, Mich	Wheel	Own	4-4 x5	25.6	Gasoline Kerosene	....
	Four Drive Tractor Co.—See Fitch.						
Frick	Frick Company, Waynesboro, Pa	Wheel	.....	4-4 x6	25.6	Kerosene	....
Fulton	Fulton Tractor Co., Anderson, Ind	Wheel	Waukesha	4-3½x5¼	19.6	Gasoline Kerosene	1275
Grain Belt G	Grain Belt Tractor Co., Fargo, N. D	Wheel	Waukesha	4-4¾x6¾	36.1	Gasoline Kerosene	2250
Gray 18-36	Gray Tractor Mfg. Co., 30th and University Aves., S. E., Minneapolis, Minn	Wheel	Waukesha	4-4¾x6¾	36.1	Gasoline Kerosene	2250
Hackney C	Hackney Mfg. Co., Prior St. and University Ave., St. Paul, Minn	Wheel	Field	4-3¾x5	22.5	Gasoline Kerosene	1250
Hackney 5	Hackney Mfg. Co., Prior St. and University Ave., St. Paul, Minn	Wheel	Climax	4-5 x6½	40.0	Gasoline Kerosene	1950

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Tractors—(Continued)

Brief Specifications, Prices and Names and Addresses of Manufacturers

Model No. or Name	Manufacturer's Name and Address	Type of Traction	Make of Motor	No. of Cylinders Bore and Stroke of Motor	N.A.C.C. H.P.	Fuel	Price
Appleton	Appleton Mfg. Co., Batavia, Ill	Wheel	Buda	4-4¼x5½	27.2	Gasoline Kerosene	....
Atlas	Midwest Engine Co. 19th St. and Martindale Ave., Indianapolis, Ind	Wheel	Waukesha	4-4¼x5¾	28.9	Gasoline Kerosene	$1565
	Avery & Sons, B. F.—See Louisville.						
Aulson	Aulson Tractor Co., Waukegan, Ill	Wheel	Climax	4-5 x6½	40.0	Gasoline Kerosene	....
Autohorse	One Wheel Truck Co. 2122 Chouteau Ave. St. Louis, Mo	Wheel	Continental	4-3¾x5	22.5	Gasoline	2100
Avery B-5-10	Avery Co., 2300 N. Adams St., Peoria, Ill	Wheel	Own	4-3 x4	14.4	Gasoline Kerosene	....
Avery 8-16	Avery Co., 2300 N. Adams St., Peoria, Ill	Wheel	Own	2-5½x6	24.2	Gasoline Kerosene Distillate	....
Avery 12-25	Avery Co., 2300 N. Adams St., Peoria, Ill	Wheel	Own	2-6½x7	33.8	Gasoline Kerosene Distillate	....
Avery 18-36	Avery Co., 2300 N. Adams St., Peoria, Ill	Wheel	Own	4-5½x6	48.4	Gasoline Kerosene Distillate	....
Avery 25-50	Avery Co., 2300 N. Adams St. Peoria, Ill	Wheel	Own	4-6½x7	67.6	Gasoline Kerosene Distillate	....
Avery 40-80	Avery Co., 2300 N. Adams St., Peoria, Ill	Wheel	Own	4-1¾x8	96.8	Gasoline Kerosene Distillate	....
Bates Steel-Mule	Joliet Oil Tractor Co., Joliet, Ill	Crawler	Erd	4-4 x6	25.6	Kerosene	....
Bean Track Pull	Bean Spray Pump Co., San Jose, Cal	Crawler	LeRoi	4-3⅛x4½	15.6	Gasoline Distillate	1340
Beeman F	Beeman Garden Tractor Co., Minneapolis, Minn	Wheel	Own	1-3½x4½	4.9	Gasoline	285
Beltrail B	Beltrail Tractor Co., 2237 Hampden Ave., St. Paul, Minn	Crawler	Waukesha	4-3¾x5¼	22.5	Gasoline Distillate	1600
Besser	Besser Mfg. Co., Alpena, Mich	Wheel	Beaver	4-4½x6	32.4	Kerosene	1895
Best 75	Best Gas Traction Co., C. L., San Leandro, Cal	Crawler	Own	4-7¾x9	96.2	Distillate	5750
Best 40	Best Gas Traction Co., C. L., San Leandro, Cal	Crawler	Own	4-6¼x6¼	62.1	Distillate	4100
Biltwel	Velie Motors Corp., Third Ave. and Third St., Moline, Ill	Wheel	Own	4-4 x5½	40.0	Kerosene	1550
Blumberg Steady Pull	Blumberg Motor Mfg. Co., San Antonio, Texas	Wheel	Own	4-3¾x5	22.5	Gasoline Coal oil	1200
Blumberg Steady Pull	Blumberg Motor Mfg. Co., San Antonio, Texas	Wheel	Own	4-3¾x5¾	22.5	Gasoline Coal oil	800
Boring	Boring Tractor Corp., 659 Race St., Rockford, Ill	Wheel	Waukesha	4-4¼x5¾	28.9	Gasoline Kerosene	1485
Brillion	Brillion Iron Works, Brillion, Wis	Wheel	Field	4-3¾x5	22.5	Kerosene	....
	Buckeye Mfg. Co.—See Trundaar.						
Bullock	Bullock Tractor Co., Chicago, Ill	Crawler	Waukesha	4-4¾x6¾	36.1	Gasoline Kerosene	2000
Bullock Jr.	Bullock Tractor Co., Chicago, Ill	Crawler	Minneapolis	4-5 x7	40.0	Gasoline Kerosene	4500
C. O. D.	C. O. D. Tractor Co., Minneapolis, Minn	Wheel	Own	2-6½x7	43.8	Kerosene	1395
Capital	Dissinger & Bro. Co., C. H. A., Fourth and Vine Sts., Wrightsville, Pa	Wheel	Own	2-7½x12	45.0	Coal oil	1400
Capital	Dissinger & Bro. Co., C. H. A., Fourth and Vine Sts., Wrightsville, Pa	Wheel	Own	4-6 x12	38.4	Coal oil	1600
Case 10-18	Case T. M. Co., J. I., State and Douglas Sts., Racine, Wis	4-Wheel	Own	4-3⅞x5	24.0	Gasoline Kerosene Distillate	1225
Case 10-20	Case T. M. Co., J. I., State and Douglas Sts., Racine, Wis	Wheel	Own	4-4¼x6	28.9	Gasoline Kerosene Distillate	1325
Caterpillar 75	Holt Manufacturing Co., Stockton, Cal	Crawler	Own	4-7½x8	90.0	Distillate	...
Caterpillar 45	Holt Manufacturing Co., Stockton, Cal	Crawler	Own	4-6 x7	57.6	Distillate	....

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Tractors—(Continued)

Brief Specifications, Prices and Names and Addresses of Manufacturers

Model No. or Name	Manufacturer's Name and Address	Type of Traction	Make of Motor	No. of Cylinders Bore and Stroke of Motor	N.A.C.C. H.P.	Fuel	Price
Chase 9-18	Chase Motor Truck Co., 332 S. West St., Syracuse, N. Y.	Wheel	Buda	4-3¾x5½	22.5	Gasoline Kerosene	$1200
Cleveland	Cleveland Tractor Co., Lamb and Euclid Aves., Cleveland, Ohio	Crawler	Weidely	4-3¾x5½	22.5	Gasoline Kerosene Distillate	1385
Coleman	Coleman Tractor Corp., Kansas City, Mo	Wheel	Climax	4-5 x6½	40.0	Kerosene	1450
	Columbus Tractor Co.—See Farmer Boy.						
Common Sense	Common Sense Gas Tractor Co., Minneapolis, Minn	Wheel	Her. hell Sp ill	3-3¼x5	33.8	Gasoline	2200
Craig	Craig Tractor Co., Bliss Rd., Cleveland, Ohio	Wheel	Beaver	4-4½x6	32.4	Kerosene	....
Dart Blue J.	Dart Truck & Tractor Corp., Waterloo, Iowa	Wheel	Buda	4-4¼x5½	28.9	Gasoline	1750
	Dauch Mfg. Co.—See Sandusky.						
	Dayton-Dick Co.—See Leader.						
Depue A	Depue Brothers Mfg. Co., Clark Bldg., Clinton, Iowa	Wheel	Buda	4-4½x6	32.4	Gasoline	2500
	Dessinger & Bro. Co., C. H. A.—See Capital.						
Dill	Dill Tractor Mfg. Co., G. I., Harrisburg, Ark	Wheel	Continental	4-4½x5½	32.4	Gasoline	2480
	Elderfields Reservation.—See Universal.						
	Electric Wheel Co.—See Allwork.						
E. B. 9-16	Emerson-Brantingham Implement Co., 1652 N. Iron St., Rockford, Ill	Wheel	Own	4-4⅛x4½	27.2	Kerosene	....
E. B. 12-20	Emerson-Brantingham Implement Co., 1652 N. Iron St., Rockford, Ill	Wheel	Own	4-4¾x5	36.1	Kerosene	....
E. B. 12-20 AA	Emerson-Brantingham Implement Co. 1652 N. Iron St. Rockford Ill	Wheel	Own	.....	.....	.....	....
E. B. 20-35	Emerson-Brantingham Implement Co. 1652 N. Iron St. Rockford Ill	Wheel	Own	4-5 x7	40.0	Kerosene	....
E. B. R40-65	Emerson-Brantingham Implement Co. 1652 N. Iron St. Rockford Ill	Wheel	Own	4-7¼x9	84.1	Kerosene	....
Eagle F12-22	Eagle Mfg. Co., Winnebago and Drew Sts., Appleton, Wis	Wheel	Own	2-7 x8	39.6	Kerosene	1496
Eagle F16-30	Eagle Mfg. Co., Winnebago and Drew Sts., Appleton, Wis	Wheel	Own	2-8 x8	51.5	Kerosene	1827
Elgin	Elgin Tractor Corp., Piqua, Ohio	Wheel	Rutenber	4-4⅛x5½	27.2	Gasoline Kerosene	1385
	Evans Mfg. Co.—See Hudson.						
Fageol	Fageol Motors Co., 107th Ave. and Hollywood Blvd., Oakland, Cal	Wheel	.....	4-3⅜x5	18.2	Gasoline Kerosene	1500
Farm Horse	Farm Horse Traction Works, Hartford, S. D	Wheel	Climax	4-5 x6½	40.0	Kerosene	1285
Farmer Boy	Columbus Tractor Co., 1908 W. Goodale St., Columbus, Ohio	Wheel	Waukesha	4-3¾x5¼	22.5	Gasoline Kerosene	1150
Fitch 3	Four Drive Tractor Co., 949 E. Maple St., Big Rapids, Mich	Wheel	Beaver	4-4¼x6	28.9	Kerosene	2500
	Ford & Son, Henry.—See Fordson.						
Fordson	Ford & Son, Henry, Dearborn, Mich	Wheel	Own	4-4 x5	25.6	Gasoline Kerosene	....
	Four Drive Tractor Co.—See Fitch.						
Frick	Frick Company, Waynesboro, Pa	Wheel	.....	4-4 x6	25.6	Kerosene	....
Fulton	Fulton Tractor Co., Anderson, Ind	Wheel	Waukesha	4-3½x5¼	19.6	Gasoline Kerosene	1275
Grain Belt G	Grain Belt Tractor Co., Fargo, N. D	Wheel	Waukesha	4-4¾x6¾	36.1	Gasoline Kerosene	2250
Gray 18-36	Gray Tractor Mfg. Co., 30th and University Aves., S. E., Minneapolis, Minn	Wheel	Waukesha	4-4¾x6¾	36.1	Gasoline Kerosene	2250
Hackney C	Hackney Mfg. Co., Prior St. and University Ave., St. Paul, Minn	Wheel	Field	4-3¾x5	22.5	Gasoline Kerosene	1250
Hackney 5	Hackney Mfg. Co., Prior St. and University Ave., St. Paul, Minn	Wheel	Climax	4-5 x6½	40.0	Gasoline Kerosene	1950

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Tractors—(Continued)

Brief Specifications, Prices and Names and Addresses of Manufacturers

Model No. or Name	Manufacturer's Name and Address	Type of Traction	Make of Motor	No. of Cylinders Bore and Stroke of Motor	N.A.C.C. H.P.	Fuel	Price
Happy Farmer F	LaCrosse Tractor Co., Front and King Sts., LaCrosse, Wis.	Wheel	Own	2-6 x7	28.8	Kerosene	$1075
Happy Farmer B	LaCrosse Tractor Co., Front and King Sts., LaCrosse, Wis	Wheel	Own	2-5¾x7	26.4	Kerosene	1075
	Hart-Parr Co.—See New Hart-Parr.						
	Hart-Parr Co.—See New Hart-Parr, also Old Reliable.						
Heider C	Rock Island Plow Co., Rock Island, Ill	Wheel	Waukesha	4-4½x6¾	32.4	Gasoline Kerosene	1395
Heider D	Rock Island Plow Co., Rock Island, Ill.	Wheel	Waukesha	4-4¼x5¾	28.9	Gasoline Kerosene	1020
Hession D	Hession Tiller & Tractor Corp., 25 E. Jewett Ave., Buffalo, N. Y.	Wheel	Erd	4-4 x6	25.6	Gasoline Kerosene	1695
	Holt Mfg. Co. See—Caterpillar.						
Hood Farm	Hood Mfg. Co., Seattle, Wash	Crawler	Buda	4-4¼x5½	28.9	Gasoline	1800
Huber Light Four	Huber Mfg. Co., Marion, Ohio	Wheel	Waukesha	4-4¼x5¾	28.9	Gasoline Kerosene	1285
Hudson K	Evans Mfg. Co., Hudson, Ohio	Wheel	Buda	4-4½x6	32.4	Gasoline	1985
Imperial 40	Imperial Machine Co., 1611 Central Ave., Minneapolis Minn		Own	4-7½x9	90.0	Gasoline Kerosene	4500
International	International Harvester Co. of America, Harvester Bldg., Chicago, Ill	Wheel	Own	4-3¼x8	16.9	Gasoline Kerosene	....
	See Mogul, also Titan.						
	Interstate Tractor Co.—See Plowman.						
J T	J. T. Tractor Co., 3810 Euclid Ave., Cleveland, Ohio	Crawler	Chief	4-4¾x6	36.1	Kerosene	1950
	Joliet Oil Tractor Co.—See Bates Steel-Mule.						
	Kansas City Hay Press Co.—See Prairie Dog.						
Kardell 4-in-1	Kardell Tractor & Truck Co., 8090 N. Broadway, St. Louis, Mo	Wheel	Waukesha	4-4½x5¾	32.4	Gasoline Kerosene	2250
Keck-Gonnerman	Keck-Gonnerman Co., Mt. Vernon, Ind	Wheel	Own	2-6½x8	33.8	Gasoline Kerosene	1250
	LaCrosse Tractor Co.—See Happy Farmer.						
Lang	Lang Tractor Co., Palace Bldg., Minneapolis, Minn.	Wheel	Climax	4-5 x6½	40.0	Gasoline Kerosene	1485
Lauson 15-25	Lauson Mfg. Co., John, W. Monroe St., New Holstein, Wis	Wheel	Own	4-4½x6	32.4	Kerosene	1895
Leader B	Dayton-Dick Co., Second and York Sts., Quincy, Ill.	Wheel	Own	2-6¼x6	31.2	Kerosene	1000
Leader C	Dayton-Dick Co., Second and York Sts., Quincy Ill.	Crawler	Minneapolis	4-5 x7½	40.0	Kerosene	2250
	Leader Tractor Mfg. Co.—See Rex.						
Lenox-American	Lenox Motor Car Co. (Hyde Park Sta.), Boston, Mass	Wheel	Wisconsin	4-4¾x5½	36.1	Gasoline	3,000
Leonard E	Leonard Tractor Co., Allen Bennett Bldg. Jackson, Mich	Wheel	Beaver	4-4½x6	32.4	Gasoline Kerosene	....
Lightfoot	Monarch Tractor Co., Watertown, Wis						
Little Giant A See page 31	**Little Giant Co., 199 Rock St., Mankato, Minn**	**Wheel**	**Own**	**4-5¼x6**	**44.1**	**Gasoline Kerosene**	**2500**
Little Giant B	**Little Giant Co., 199 Rock St., Mankato, Minn**	**Wheel**	**Own**	**4-4¼x5**	**25.9**	**Gasoline Kerosene**	**1650**
Louisville	Avery & Sons, B. F., Louisville, Ky	Wheel	Own	2-5¾x7	26.4	Gasoline Kerosene	....
Master	Master Tractor Co., Minneapolis, Minn	Wheel	Doman	4-4¾x6	36.1	Gasoline Kerosene	1550
Maxwell See page 55	**Maxwell Motor Sales Corp., Detroit, Mich**	**Wheel**	**Own**	**4-4¼x6**	**28.9**	**Gasoline**	....
Merchant See page 377	**Merchant & Evans Co., Philadelphia, Pa.**						
	Midwest Engine Co.—See Atlas.						
	Minneapolis Steel & Machinery Co.—See Twin City						

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Tractors—(Continued)

Brief Specifications, Prices and Names and Addresses of Manufacturers

Model No. or Name	Manufacturer's Name and Address	Type of Traction	Make of Motor	No. of Cylinders Bore and Stroke of Motor	N.A.C.C. H.P.	Fuel	Price
Minneapolis 15	Minneapolis Threshing Machine Co., Hopkins, Minn.	Wheel	Minneapolis	4-4½x7	32.4	Kerosene	....
Minneapolis 20	Minneapolis Threshing Machine Co., Hopkins, Minn.	Wheel	Minneapolis	4-5¾x7	52.9	Kerosene	....
Minneapolis 40	Minneapolis Threshing Machine Co., Hopkins, Minn.	Wheel	Minneapolis	4-7¼x9	44.1	Kerosene	....
Mogul 10-20	International Harvester Co. of America, Harvester Bldg., Chicago, Ill.	Wheel	Own	1-8½x2	28.9	Gasoline Kerosene	1125
	Monarch Tractor Co.—See Lightfoot.						
	Monarch Tractor Co.—See "Neverslip."						
Motox	Plano Tractor Co., Wabash, Ind.	Wheel	Buda	4-4¼x5½	28.9	Gasoline Kerosene	1850
National E	National Tractor Co., Cedar Rapids, Iowa.	Wheel	Waukesha	4-3½x5¼	19.6	Gasoline Kerosene	1075
National F	National Tractor Co., Cedar Rapids, Iowa.	Wheel	Waukesha	4-4¼x5¾	28.9	Gasoline Kerosene	1375
Neverslip 30-18	Monarch Tractor Co., Watertown, Wis.	Crawler	.....	4-4¾x6	36.1	Gasoline Kerosene	2250
Neverslip 20-12	Monarch Tractor Co., Watertown, Wis.	Crawler	.....	4-4x6	25.6	Gasoline Kerosene	1850
New Age D-4	New Age Tractor Co., Minneapolis, Minn.	Wheel	Beaver	4-4x6½	32.4	Kerosene	....
New Hart-Parr	Hart-Parr Co., Lawler St., Charles City, Iowa	Wheel	Own	4-6½x7	31.6	Kerosene	1395
Nilson Junior	Nilson Tractor Co., Minneapolis, Minn.	Wheel	Waukesha	4-4¼x5¾	28.9	Gasoline Kerosene	1775
Nilson Senior	Nilson Tractor Co., Minneapolis, Minn.	Wheel	Waukesha	4-4¾x6¾	36.1	Gasoline Kerosene	2475
	Ohio Mfg. Co.—See Whitney.						
Parrett E	Parrett Tractor Co., 343 S. Dearborn St., Chicago, Ill.	Wheel	Buda	4-4¼x5½	28.9	Kerosene	....
Parrett H	Parrett Tractor Co., 343 S. Dearborn St., Chicago, Ill.	Wheel	Buda	4-4¼x5½	28.9	Kerosene	....
Peoria 12-25	Peoria Tractor Corp., 1135-45 W. Washington St., Peoria, Ill.	Wheel	Climax	4-5 x6½	40.0	Kerosene	1985
Pioneer Special	Pioneer Tractor Mfg. Co., Carmona St., Winona, Minn.	Wheel	Own	4-5½x6	48.4	Kerosene	....
Pioneer 30	Pioneer Tractor Mfg. Co., Carmona St., Winona, Minn.	Wheel	Own	4-7 x8	74.4	Kerosene	....
	Plano Tractor Co.—See Motox.						
Plowman 13-30	Interstate Tractor Co., Fourth St. and Limits, Waterloo, Iowa.	Wheel	Buda	4-4¼x5½	28.9	Kerosene	1595
Plowman 15-30	Interstate Tractor Co., Fourth St. and Limits, Waterloo, Iowa.	Wheel	Buda	4-4½x6	32.4	Kerosene	1895
Prairie Dog	Kansas City Hay Press Co., Fourth St. Viaduct, Kansas City, Mo.	Wheel	Waukesha	4-3¾x5¼	22.5	Gasoline Kerosene	1150
R. P. 2	R. & P. Tractor Co., Alma, Mich.	Wheel	Waukesha	4-3¾x5¼	22.5	Gasoline	1485
Reed	Reed Foundry & Machine Co., Kalamazoo, Mich.	Wheel	Waukesha	4-4 x5¾	25.6	Gasoline Kerosene	1400
Rex	Leader Tractor Mfg. Co., 2-6 S. W. Ninth St., Des Moines, Iowa.	Wheel	Waukesha	4-4¼x5¾	28.9	Gasoline Kerosene	....
	Rock Island Plow Co.—See Heider.						
Samson 25	Samson Sieve-Grip Tractor Co., Stockton, Cal.	Wheel	Own	4-4¼x6¾	28.9	Gasoline Distillate	1750
Sandusky J	Dauch Mfg. Co., Sandusky, Ohio.	Wheel	Own	4-4¼x5¼	28.9	Gasoline Kerosene	1500
Sandusky E	Dauch Mfg. Co., Sandusky, Ohio.	Wheel	Own	4-5 x6½	40.0	Gasoline Kerosene	2500
Shelby	Shelby Tractor & Truck Co. Franklin Ave., Shelby, Ohio.	Wheel	Erd	4-4¼x6	28.9	Kerosene	....
Simplicity 12-20	Turner Mfg. Co., 218 Lake St., Port Washington, Wis.	Wheel	Waukesha	4-3¾x5¼	22.5	Gasoline Kerosene	1395
Simplicity 14-25	Turner Mfg. Co., 218 Lake St., Port Washington, Wis.	Wheel	Buda	4-4¼x5¼	28.9	Gasoline Kerosene	1625
Standard	Standard Tractor Co., Stillwater, Minn.	Wheel	Waukesha	4-4¾x6¾	36.1	Gasoline Kerosene	2100
Standard-Detroit	Standard-Detroit Tractor Co., Detroit, Mich.	Wheel	Beaver	4-3¾x5	22.5	Gasoline	1065
Star	Star Tractor Co. Walnut St., Finlay, Ohio	Wheel	LeRoi	4-3⅛x4½	15.6	Gasoline	790
Stinson	Stinson Tractor Co., Minneapolis, Minn.	Wheel	Beaver	4-4¾x6	36.1	Kerosene	2000
Stone 2	Stone Tractor Mfg. Co., 204 Third St., Texarkana, Tex.	Wheel	Beaver	4-4½x6	32.4	Kerosene	1425

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Tractors—(Continued)

Brief Specifications, Prices and Names and Addresses of Manufacturers

Model No. or Name	Manufacturer's Name and Address	Type of Traction	Make of Motor	No. of Cylinders Bore and Stroke of Motor	M.A.C.C. H.P.	Fuel	Price
Stone	Stone Tractor Mfg. Co., 204 Third St., Texarkana, Tex.	Wheel	Waukesha	4-4¼x5	28.9	Gasoline Kerosene	1150
Stutes-Mar	Stutes-Mar Farm Tractor Co., Chicago, Ill	Crawler	Waukesha	4-4½x6¾	32.4	Kerosene Distillate	
Square Turn A	Square Turn Tractor Co., Chicago, Ill.	Wheel	Climax	4-5 x6½	40.0	Gasoline Kerosene	1875
Titan 10-20	International Harvester Co. of America, Harvester Bldg., Chicago, Ill.	Wheel	Own	2-6½x8	33.8	Gasoline Kerosene	1225
Topp-Stewart A	Topp-Stewart Tractor Co., Clintonville, Wis.	4 Wheel	Waukesha	4-4¾x6¾	36.1	Gasoline	2750
Trojan	Trojan Tractor Co., Waterloo, Iowa	Wheel	Waukesha	4-4¾x6¾	36.1	Gasoline Kerosene	....
Trundaar	Buckeye Mfg. Co., 1801-09 Columbus Ave., Anderson, Ind.	Chain	6¾ Wauk.	4-4¾x6¾	36.1	Gasoline Kerosene	
	Turner Mfg. Co.—See Simplicity.						
Twin City	Minneapolis Steel & Machinery Co., Minneapolis, Minn.	Wheel	Own	4-6½x8	62.1	Gasoline Kerosene	
Uncle Sam 20-30	U. S. Tractor & Machinery Co., 110 S. Dearborn St., Chicago, Ill.	Wheel	.....	4-4½x6	48.6	Kerosene	....
	U. S. Tractor & Machinery Co.—See Uncle Sam.						
Universal A-18	Elderfields Reservation, Port Washington N. Y.	Wheel	Own	1-3½x5	4.9	Gasoline	365
Universal A-19	Elderfields Reservation, Port Washington, N. Y.	Wheel	Own	1-3½x5	4.9	Gasoline	....
	Velie Motors Corp.—See Biltwel.						
Victory Cub	Victory Tractor Co., Greensburg, Ind.	Wheel	Lycoming	4-3½x5	19.6	Gasoline	985
Waterloo Boy N	Waterloo Gasoline Engine Co., Waterloo, Iowa	Wheel	Own	2-6½x7	28.8	Kerosene	1250
Whitney	Ohio Mfg. Co., Upper Sandusky, Ohio.	Wheel	Gile	2-5½x6½	24.2	Gasoline	1050
Wichita	Wichita Tractor Co., 421-23 N. Water St., Wichita, Kans.	Wheel	Gile	2-5 x6½	20.0	Gasoline	1050
Wisconsin	Wisconsin Farm Tractor Co., Sauk City, Wis.	Wheel	Climax	4-5 x6½	40.0	Kerosene	2250
Yankee	American Tractor Corp., Peoria, Ill.	Wheel	Erd	4-4 x6	25.6	Gasoline Kerosene	1800
Yuba 20-35	Yuba Mfg. Co., Marysville, Cal.	Crawler	.....	4-5¼x7	44.1	Gasoline Distillate	
Yuba 12-20	Yuba Mfg. Co., Marysville, Cal.	Crawler	.	4-4½x6¾	32.4	Gasoline Distillate	...
Zelle 12-25	Zelle Tractor Company, St. Louis, Mo.	Wheel		4-4¼x5½	28.9	Kerosene	1700

Motorcycles

Brief Specifications, Prices and Names and Addresses of Manufacturers

Model No. or Name	Manufacturer's Name and Address	No. of Cylinders Bore and Stroke of Motor	Make of Motor	Transmission	Price
Cleveland A-2	Cleveland Motorcycle Mfg. Co., 7209 Platt Ave., Cleveland, Ohio	1-2½x2¾	Own	Worm.	$175
	Cyclemotor Corp.—See Evans.				
Emblem 106	Emblem Mfg. Co., Angola, N. Y.	2-2⅝x3	Own	Direct Chain.	200
				Three-Speed Chain	225
Excelsior 19	Excelsior Motor Mfg. & Supply Co., 3701 Cortland St., Chicago, Ill.	2-3 21/64x3½	Own	Three-Speed Chain	350
	See also Henderson.				370
Evans	Cyclemotor Corp., 149 Cady St., Rochester, N. Y.	1-2 x1¾	Own	Direct Belt	100
Harley-Davidson 18B	Harley-Davidson Motor Co., 3732 Chestnut St., Milwaukee, Wis.	1-3 5/16x4	Own	Direct Chain.	235
Harley-Davidson 18C		1-3 5/16x4	Own	Three-Speed Chain	260
Harley-Davidson 18E		2-3 5/16x4	Own	Direct Chain	275
Harley-Davidson 18F		2-3 5/16x4	Own	Three-Speed Chain	290
Harley-Davidson 18J		2-3 5/16x4	Own	Three-Speed Chain	320

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Motorcycles—(Continued)

Brief Specifications, Prices and Names and addresses of Manufacturers

Model No. or Name	Manufacturer's Name and Address	No. of Cylinders Bore and Stroke of Motor	Make of Motor	Transmission	Price
	Hendee Mfg. Co.—See Indian.				
	Independent Pneumatic Tool Co.—See Thor.				
Henderson	Excelsior Motor Mfg.& Supply Co.,3701 Cortland St., Chicago, Ill.	4-2¾x3	Own	Three-Speed Chain	385 435
Indian Powerplus N.18	Hendee Mfg. Co., 837 State St., Springfield, Mass.	2-3⅛x3 11/16	Own	Three-Speed Chain	295
Indian O-18		2-2 x2½	Own	Three-Speed Chain	185
Iver Johnson 16-4B	Johnson's Arms & Cycle Works, Iver, 109 River St., Fitchburg, Mass.	1-3¼x3¾	Own	Direct Belt	150
Iver Johnson 16-4C		1-3¼x3¾	Own	Direct Chain	175
Iver Johnson 16-4 C.T.S.		1-3¼x3¾	Own	Direct Chain	200
Iver Johnson 16-7		2-3¼x3¾	Own	Direct Chain	225
Iver Johnson 16-7 T. S.		2-3¼x3¾	Own	Direct Chain	250
Pope I. 18	Westfield Mfg. Co., Westfield, Mass.	2-3 11/16x3½	Own	Three-Speed Chain	295
Reading Standard 18S	Reading Standard Co., Water St., Reading, Pa.	1-3⅜x3¾	Own	Three-Speed Chain	260
Reading Standard 18T		2-3⅜x4	Own	Three-Speed Chain	295
Thor 18-U	Independent Pneumatic Tool Co., 600 W. Jackson Blvd., Chicago, Ill.	2-7/25x7/40	Own	Three-Speed Chain	290
Thor 18-UE		2-7/25x7/40	Own	Three-Speed Chain	330
	Westfield Mfg. Co.—See Pope.				

Motor Boats

Brief Specifications, Prices and Names and Addresses of Manufacturers

Manufacturer's Name and Address	Type of Boat	Length	H. P.	No. of Cylinders	Price
Albany Boat Corp., Broadway, Watervliet, N. Y.	Runabout	36	60	6	$4500
	Runabout	35	150	8	9000
	Cruiser	40	100	6	12,000
	Cruiser	50	200	12	20,000
Belle Isle Boat & Engine Co., 2092 Jefferson Ave., E., Detroit, Mich.	V. Bottom Runabout	26	.....	4	.....
Cape Cod Power Dory Co., 453 Main St., Wareham, Mass.	Dory	20	4	1	450
	Dory	24	8-10	2	885
	Cruiser	30	10-20	..	.....
Dachel-Carter Boat Co., Benton Harbor, Mich.	Runabout	24	30	4	2000
	Cruiser	40	100	6	8000
Elco Works, Ave. A. and North St., Bayonne, N. J.	Elco Express	30	65	4	3950
	Elco Express	36	100	6	5200
	Cruisette	32	20	4	3500
	Cruiser	45	37	4	8000
Everett-Hunter Boat Co., McHenry, Ill.	Runabout	22	12-15	4	800
	Runabout	25	12-15	4	850
Fay & Bowen Engine Co., Lake St., Geneva, N. Y.	Runabout	24	17	4	1550
	Runabout	30	50	6	3100
Great Lakes Boat Building Corp., 333 Bleecker St., Milwaukee, Wis.	Runabout	30	50	6	3100
Harker Boat Co., John L., 323 Crane St., Detroit, Mich.	Runabout	26	40 60	4	2500 2700
	Runabout	32	100 145	4	4850 6250
Hafer Boat Works, Spirit Lake, Iowa	Runabout	27	28 36	4	1350
	V. Bottom	24	50	4	1700
Mullins Co., W. H., 182 Franklin St., Salem, Ohio	Auto Boat	26	20	4	1750
	Auto Boat	26	35	4	2350
	Launch	18	8	2	410
	Launch	18	8-10	4	520
	Launch	16	3	1	220
	Auto Boat	20	8-10	4	830
	Auto Boat	20	8	2	760
	Mullins Arrow	25	20	4	1725
	Mullins Arrow	25	35	4	2375
	Dixie Flyer	21	8-10	4	970
		21	12	4	1125
		21	8	2	925
	Launch	17	8-10	4	560
	Launch	17	8	2	425

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Tractors—(Continued)

Brief Specifications, Prices and Names and Addresses of Manufacturers

Model No. or Name	Manufacturer's Name and Address	Type of Traction	Make of Motor	No. of Cylinders Bore and Stroke of Motor	M.A.C.C. H.P.	Fuel	Price
Stone	Stone Tractor Mfg. Co., 204 Third St., Texarkana, Tex.	Wheel	Waukesha	4-4¼x5	28.9	Gasoline Kerosene	1150
Stutes-Mar	Stutes-Mar Farm Tractor Co., Chicago, Ill	Crawler	Waukesha	4-4½x6¾	32.4	Kerosene Distillate	.
Square Turn A	Square Turn Tractor Co., Chicago, Ill.	Wheel	Climax	4-5 x6½	40.0	Gasoline Kerosene	1875
Titan 10-20	International Harvester Co. of America, Harvester Bldg., Chicago, Ill.	Wheel	Own	2-6½x8	33.8	Gasoline Kerosene	1225
Topp-Stewart A	Topp-Stewart Tractor Co., Clintonville, Wis.	4 Wheel	Waukesha	4-4¾x6¾	36.1	Gasoline	2750
Trojan	Trojan Tractor Co., Waterloo, Iowa	Wheel	Waukesha	4-4¾x6¾	36.1	Gasoline Kerosene	.
Trundaar	Buckeye Mfg. Co., 1801-09 Columbus Ave., Anderson, Ind.	Chain	6¾ Wauk.	4-4¾x6¾	36.1	Gasoline Kerosene	.
	Turner Mfg. Co.—See Simplicity.						
Twin City	Minneapolis Steel & Machinery Co., Minneapolis, Minn.	Wheel	Own	4-6½x8	62.1	Gasoline Kerosene	.
Uncle Sam 20-30	U. S. Tractor & Machinery Co., 110 S. Dearborn St., Chicago, Ill.	Wheel	.....	4-4½x6	48.6	Kerosene	.
	U. S. Tractor & Machinery Co.—See Uncle Sam.						
Universal A-18	Elderfields Reservation, Port Washington N. Y.	Wheel	Own	1-3½x5	4.9	Gasoline	365
Universal A-19	Elderfields Reservation, Port Washington, N. Y.	Wheel	Own	1-3½x5	4.9	Gasoline	....
	Velie Motors Corp.—See Biltwel.						
Victory Cub	Victory Tractor Co., Greensburg, Ind.	Wheel	Lycoming	4-3½x5	19.6	Gasoline	985
Waterloo Boy N	Waterloo Gasoline Engine Co., Waterloo, Iowa	Wheel	Own	2-6½x7	28.8	Kerosene	1250
Whitney	Ohio Mfg. Co., Upper Sandusky, Ohio	Wheel	Gile	2-5½x6½	24.2	Gasoline	1050
Wichita	Wichita Tractor Co., 421-23 N. Water St., Wichita, Kans.	Wheel	Gile	2-5 x6½	20.0	Gasoline	1050
Wisconsin	Wisconsin Farm Tractor Co., Sauk City, Wis.	Wheel	Climax	4-5 x6½	40.0	Kerosene	2250
Yankee	American Tractor Corp., Peoria, Ill.	Wheel	Erd	4-4 x6	25.6	Gasoline Kerosene	1800
Yuba 20-35	Yuba Mfg. Co., Marysville, Cal.	Crawler	.....	4-5¼x7	44.1	Gasoline Distillate	
Yuba 12-20	Yuba Mfg. Co., Marysville, Cal.	Crawler	.	4-4½x6¾	32.4	Gasoline Distillate	...
Zelle 12-25	Zelle Tractor Company, St. Louis, Mo	Wheel		4-4¼x5½	28.9	Kerosene	1500

Motorcycles

Brief Specifications, Prices and Names and Addresses of Manufacturers

Model No. or Name	Manufacturer's Name and Address	No. of Cylinders Bore and Stroke of Motor	Make of Motor	Transmission	Price
Cleveland A-2	Cleveland Motorcycle Mfg. Co., 7209 Platt Ave., Cleveland, Ohio	1-2½x2¾	Own	Worm.	8175
	Cyclemotor Corp.—See Evans.				
Emblem 106	Emblem Mfg. Co., Angola, N. Y.	2-2⅝x3	Own	Direct Chain Three-Speed Chain	200 225
Excelsior 19	Excelsior Motor Mfg. & Supply Co., 3701 Cortland St. Chicago, Ill. See also Henderson.	2-3 11/16x3½	Own	Three-Speed Chain	350 370
Evans	Cyclemotor Corp., 149 Cady St., Rochester, N. Y.	1-2 x1¾	Own	Direct Belt	100
Harley-Davidson 18B	Harley-Davidson Motor Co., 3732 Chestnut St., Milwaukee, Wis.	1-3 5/16x4	Own	Direct Chain.	235
Harley-Davidson 18C		1-3 5/16x4	Own	Three-Speed Chain	260
Harley-Davidson 18E		2-3 5/16x4	Own	Direct Chain	275
Harley-Davidson 18F		2-3 5/16x4	Own	Three-Speed Chain	290
Harley-Davidson 18J		2-3 5/16x4	Own	Three-Speed Chain	320

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Motorcycles—(Continued)

Brief Specifications, Prices and Names and addresses of Manufacturers

Model No. or Name	Manufacturer's Name and Address	No. of Cylinders Bore and Stroke of Motor	Make of Motor	Transmission	Price
	Hendee Mfg. Co.—See Indian.				
	Independent Pneumatic Tool Co.—See Thor.				
Henderson	Excelsior Motor Mfg.& Supply Co.,3701 Cortland St., Chicago, Ill.	4–2¾x3	Own	Three-Speed Chain	385 435
Indian Powerplus N.18	Hendee Mfg. Co., 837 State St., Springfield, Mass.	2-3⅛x3 11/32	Own	Three-Speed Chain	295
Indian O-18		2-2 x2½	Own	Three-Speed Chain	185
Iver Johnson 16-4B	Johnson's Arms & Cycle Works, Iver, 109 River St., Fitchburg, Mass.	1-3¼x3¾	Own	Direct Belt	150
Iver Johnson 16-4C		1-3¼x3¾	Own	Direct Chain	175
Iver Johnson 16-4 C.T.S.		1-3¼x3¾	Own	Direct Chain	200
Iver Johnson 16-7		2-3¼x3¾	Own	Direct Chain	225
Iver Johnson 16-7 T. S.		2-3¼x3¾	Own	Direct Chain	250
Pope I. 18	Westfield Mfg. Co., Westfield, Mass.	2-3 11/16x3½	Own	Three-Speed Chain	295
Reading Standard 18S	Reading Standard Co., Water St., Reading, Pa.	1-3⅜x3¾	Own	Three-Speed Chain	260
Reading Standard 18T		2-3⅜x4	Own	Three-Speed Chain	295
Thor 18-U	Independent Pneumatic Tool Co., 600 W. Jackson Blvd., Chicago, Ill.	2-7/32x7/10	Own	Three-Speed Chain	290
Thor 18-UE		2-7/32x7/10	Own	Three-Speed Chain	330
	Westfield Mfg. Co.—See Pope.				

Motor Boats

Brief Specifications, Prices and Names and Addresses of Manufacturers

Manufacturer's Name and Address	Type of Boat	Length	H. P.	No. of Cylinders	Price
Albany Boat Corp., Broadway, Watervliet, N. Y.	Runabout	36	60	6	$4500
	Runabout	35	150	8	9000
	Cruiser	40	100	6	12,000
	Cruiser	50	200	12	20,000
Belle Isle Boat & Engine Co., 2092 Jefferson Ave., E., Detroit, Mich.	V. Bottom Runabout	26	.....	4	.....
Cape Cod Power Dory Co., 453 Main St., Wareham, Mass.	Dory	20	4	1	450
	Dory	24	8–10	2	885
	Cruiser	30	10–20	..	.....
Dachel-Carter Boat Co., Benton Harbor, Mich.	Runabout	24	30	4	2000
	Cruiser	40	100	6	8000
Elco Works, Ave. A. and North St., Bayonne, N. J.	Elco Express	30	65	4	3950
	Elco Express	36	100	6	5200
	Cruisette	32	20	4	3500
	Cruiser	45	37	4	8000
Everett-Hunter Boat Co., McHenry, Ill.	Runabout	22	12–15	4	800
	Runabout	25	12–15	4	850
Fay & Bowen Engine Co., Lake St., Geneva, N. Y.	Runabout	24	17	4	1550
	Runabout	30	50	6	3100
Great Lakes Boat Building Corp., 333 Bleecker St., Milwaukee, Wis.	Runabout	30	50	6	3100
Hacker Boat Co., John L., 323 Crane St., Detroit, Mich.	Runabout	26	40 60	4	2500 2700
	Runabout	32	100 145	4	4850 6250
Hafer Boat Works, Spirit Lake, Iowa	Runabout	27	28 36	4	1350
	V. Bottom	24	50	4	1700
Mullins Co., W. H., 182 Franklin St., Salem, Ohio	Auto Boat	26	20	4	1750
	Auto Boat	26	35	4	2350
	Launch	18	8	2	410
	Launch	18	8–10	4	520
	Launch	16	3	1	220
	Auto Boat	20	8–10	4	830
	Auto Boat	20	8	2	760
	Mullins Arrow	25	20	4	1725
	Mullins Arrow	25	35	4	2375
	Dixie Flyer	21	8–10	4	970
		21	12	4	1125
		21	8	2	925
	Launch	17	8–10	4	560
	Launch	17	8	2	425

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Motor Boats—(Continued)

Brief Specifications, Prices and Names and Addresses of Manufacturers

Manufacturer's Name and Address	Type of Boat	Length	H.P.	No. of Cylinders	Price
Niagara Motor Boat Co., 210 Sweeney St., North Tonawanda, N. Y.	Runabout	28	35	4	$3800
	Runabout	32	45	4	4300
Racine Boat Co. 1811 Holborn St., Racine, Wis	Wisco Runabout	19	12	4	570
	Raco Runabout	25	20-30	4	1510
	Runabout	30	35	4	2000
	Runabout	35	40	4	2465
	Speed Boat	19	6	2	635
	Speed Boat	19	10	4	520
	Launch	25	11	2	635
	Launch	30	15	2	850
	Launch	30	27-36	4	1375
Reliance Motor Boat Co., 207th St. and Harlem River, W., New York, N. Y.	Runabout	26	90	4	4500
	Runabout	30	135	6	6000
Richardson Boat Co., North Tonawanda, N. Y.	Runabout	25	17-2	4	2000
Sea Bright Dory Works, 491 Atlantic Ave., Long Branch, N. J.	Dory	21	11	1	636
	Dory Cruiser	35	25	4	.....
Toppan Boat Mfg. Co., 87 N. Washington St. Boston Mass.	Dory	18	3	1	375
	Dory	20	6	2	475
	Dory	22	8	4	700
	Launch	22	12	4	1200
	Launch	26½	16	4	1500
Valley Boat Co., 700 Hess St., Saginaw, Mich.	Launch	16½	9	4	425
	Shallow Draft Launch	19	12, 15, 20	4	750
Ventnor Boat Works, Atlantic City, N. J	Runabout	20	24	4	985
White & Co., E. M. 156 Water St., Oldtown, Me.	Runabout	20	5	2	350

Aircraft

AEROPLANES, HYDRO-AEROPLANES and FLYING BOATS

Aeromarine Plane & Motor Co., Keyport, N. J.
Alexandria Aircraft Corp., Alexandria, Va.
Anglo-American Corp., 42 Broadway, New York, N. Y.
Boeing Airplane Co., (Georgetown), Seattle, Wash.
Burgess Co., Marblehead, Mass.
Chicago Aero Works, 202 N. Wabash Ave., Chicago, Ill.
Continental Aircraft Corp., 120 Liberty St., New York, N. Y.
Cooper Aeroplane Co., John D., Bridgeport, Conn.
Curtiss Aeroplane & Motor Corp., 2000 N. Elmwood Ave., Buffalo, N. Y.
Dayton-Wright Airplane Co. (Moraine City), Dayton, O.
Dewey Aeroplane Co., Dewey, Okla.
Gallaudet Aircraft Corp., East Greenwich, R. I.
Heinrich Corp., A. S., Freeport, N. Y.
Knabenshue Mfg. Co., East Northport, N. Y.
L. W. F. Engineering Co., College Point, N. Y.
Lanzius Aircraft Co., 156 Broadway, New York, N. Y.
Lawrence-Lewis Aeroplane Co., Peoples Gas Bldg., Chicago, Ill.
Lawson Aircraft Corp., Pearl & Howard Sts., Green Bay, Wis.
Lewis & Vought Corp., Webster & Seventh Aves., Long Island City, N. Y.
Liberty Iron Works, Sacramento, Cal.
Loening Aeronautical Engr. Corp., 45 11th St., Long Island City, N. Y.
Martin Aeroplane Factory, Elyria, O.
Martin Co., G. L., 16800 St. Clair Ave., Cleveland, O.
Ordnance Engineering Corp., 120 Broadway, New York, N. Y.
Richardson Aeroplane Corp., New Orleans, La.
Rubay Co., 1318 W. 78th St., Cleveland, O.
Standard Aircraft Corp., Brunswick Ave., Elizabeth, N. J.
Sturtevant Aeroplane Co., Williams St. (Jamaica Plain), Boston, Mass.
Thomas-Morse Aircraft Corp., Ithaca, N. Y.
Victor Aircraft Corp., Freeport, N. Y.
Walden-Butler Co., 281-89 Butler St., Brooklyn, N. Y.
Walden-Hinners Co., Edgewater, N. J.
West Virginia Aircraft Co., Wheeling, W. Va.
White Co., George D., 107-21 E. 49th St., Los Angeles, Cal.
Whittemore-Hamm Co., 130 Brookside Ave. (Jamaica Plain), Boston, Mass.
Williams Bros. Aircraft Corp., 816 Oak St., San Francisco, Cal.
Wittemann-Lewis Aircraft Co., Lincoln Highway, Newark, N. J.
Wright-Martin Aircraft Corp., New Brunswick, N. J.

DIRIGIBLES

Knabenshue Aircraft Corp., 140 W. 42d St., New York, N. Y.

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SECTION 2

Accessories, parts, materials and supplies for automobiles, commercial vehicles, tractors, motorcycles, motor boats and aircraft. Specialties for Ford cars; also machinery, tools, shop equipment and supplies for factories, garages and repair shops.

EVERYTHING in this section is listed alphabetically under the NOUN.

For example: "Pressed Steel Frames" *are listed under* "Frames,"—"Roller Bearings" *under* "Bearings."

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(PATENTED)

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1790 BROADWAY NEW YORK

Ball, Roller, Thrust and Combination Bearings

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SECTION II

Accessories, Parts, Machinery and Tools

Every product listed in this section is classified alphabetically under the NOUN or principal word.

ABRASIVE PAPERS—See Paper, Emery and Sand

ACCELERATOR PEDALS—See Pedals, Special Accelerator

ACCELERATOR PEDALS FOR FORDS—See Accelerators, Foot

ACCELERATORS, FOOT—See Pedals, Special Accelerator

ACCELERATORS, Foot, for Fords

(Foot pedals for controlling throttle)

Apco Mfg. Co., Eddy St., Providence, R. I.

B. M. W.—See Geneseo Auto Supply Co.

Bull Dog—See Thomas Co.

Comfort Motor Machine Co., 715 Galapago St., Denver, Colo. "Simplex."

Cooper Mfg. Co.—See Fulton Co.

Crum-Wiley Mfg. Co., Peru, Ind.

Donlin Auto Co., C. A., Hopkins, Mo.

Ewald—See Zinke Co.

Excelsior Auto Parts & Supply Co., 200 Cannon St., Bridgeport, Conn.

Ford Relief Spring & Frame Supporter Co., 7 E. 42d St., New York, N. Y.

Fulton Co., 1910 St. Paul Ave., Milwaukee, Wis. (Sole Distributors for Cooper Mfg. Co., Marshalltown, Ia.) (See page 139.)

Gemco Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. (See page 135.)

Geneseo Auto Supply Co., Geneseo, Ill. "B. M. W."

"Go" Motor-Speeder Co., 165 Third Ave., Three Rivers, Mich.

Hackney—See Roller Bearing Foot Pedal Co.

Heaton & Ault Mfg. Co., 6248 Greenwood Ave., Chicago, Ill.

Humboldt Machine & Stamping Co., 31-35 Tenth St., Long Island City, N. Y.

Martens Co., E. A., Ninth & Main Sts., Lafayette, Ind.

Nelson Mfg. Co., A., 2700 Southport Ave., Chicago, Ill.

New Era Spring & Specialty Co., 1138 Hamilton St., N. W., Grand Rapids, Mich. (See page 355.)

Nifty—See Sapp, Will A.

Perkins-Campbell Co., 624 Broadway, Cincinnati, O. (See page 237.)

Presto—See R. & R. Mfg. Co.

R. & R. Mfg. Co., 144 S. Delaware St., Indianapolis, Ind. "Presto."

Roller Bearing Foot Pedal Co., Fourth & Jackson Sts., St. Paul, Minn. "Hackney."

Romort Mfg. Co.—See Zinke Co.

Sapp, Will A., Elgin, Neb. "Nifty."

Simplex—see Comfort Motor Machine Co.

Star Specialty Mfg. Co., 227-33 W. Erie St., Chicago, Ill.

Thomas Co., W. H., Main St., Spencer, Ia. "Bull Dog."

Walker Mfg. Co., Hamilton & Michigan Sts., Racine, Wis.

Webber & Co., Philip H., Hoopeston, Ill. (See page 609.)

Williams Bros. Aircraft Corp., 316 Oak St., San Francisco, Cal.

Zinke Co., 1323-25 Michigan Ave., Chicago, Ill. (Sole Distributors for Romort Mfg. Co., Oakfield, Wis.) "Ewald." (See pages 548 and 549.)

ACCIDENT CASES—See Cases, Medical Emergency.

ACCOUNTING BOOKS—See Books, Accounting

ACCOUNTING SYSTEMS—See Books, Accounting

ACETYLENE BRAZING TORCHES—See Torches, Acetylene

ACETYLENE BURNER CLEANERS—See Cleaners, Acetylene

ACETYLENE BURNERS — See Burners, Acetylene Lamp

ACETYLENE GAS ENGINE STARTERS—See Starters, Acetylene Gas Engine

ACETYLENE GAS PURIFIERS—See Purifiers, Acetylene Gas

ACETYLENE GENERATORS—See Generators, Acetylene

ACETYLENE HEADLIGHTS—See Lamps or Headlights, Acetylene

ACETYLENE HEADLIGHTS, TRACTOR—See Headlights, Tractor Acetylene

ACETYLENE LAMP BURNERS—See Burners, Acetylene Lamp

ACETYLENE LAMP CONNECTORS—See Connectors, Acetylene Lamp

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ACETYLENE LAMP LIGHTERS—See Lighters, Acetylene Lamp

ACETYLENE LAMPS—See Lamps, or Headlights, Acetylene

ACETYLENE PRESSURE REGULATORS——See Regulators, Acetylene Pressure

ACETYLENE TANK KEYS—See Keys, Acetylene

ACETYLENE TANKS—See Tanks, Acetylene

ACETYLENE WELDING TORCHES—See Torches, Acetylene Welding

ACID, BATTERY—See Electrolyte, Battery

ACID, SOLDERING—See Flux, Soldering

ADAPTERS, CHASSIS—See Converters, Chassis

ADAPTERS, Electric Lamp

(For converting gas or oil lamps into electric lamps)

Chicago Electric Mfg. Co., 2817 S. Halsted St., Chicago, Ill. "Handy."

General Electric Co., Schenectady, N. Y. (See pages 564 and 565.)

Gil-Bo—See Metal Specialties Mfg. Co.

Gray & Davis, Boston, Mass. (See page 651.)

Hammer Co., E. A., 1839 Euclid Ave., Cleveland, O.

Handy—See Chicago Electric Mfg. Co.

Metal Specialties Mfg. Co., 338-52 N. Kedsie Ave., Chicago, Ill. "Gil-Bo." (See page 333.)

Morse, Frank W., 289 Congress St., Boston, Mass. (See page 453.)

Picard & Co., A. J., 9 W. 61st St., New York, N. Y. (Metropolitan Distributors for "Handy" Adapters.) (See page 273.)

Rosco—See Rosen & Co.

Rosen & Co., A. W., 610-14 Broadway, New York, N. Y. "Rosco."

S-H—See Stuart-Howland Co.

Smith Mfg. Co., F. A., 185-87 N. Water St., Rochester, N. Y.

Stuart-Howland Co., 131-41 Federal St., Boston, Mass. "S-H."

Tillery-Wall Mfg. Co., Oregon, Mo.

ADJUSTABLE VALVE LIFT RODS—See Rods, Adjustable Valve Lift

ADJUSTABLE WRENCHES — See Wrenches

ADJUSTERS, BELT, FOR FORDS—See Adjusters, Fan Belt

ADJUSTERS, Carburetor or Dash Controls, for Fords

(A device to enable the carburetor needle valve to be adjusted from the dashboard)

Standard Thermometer Co., 65 Shirley St., Boston, Mass. (See page 541.)

ADJUSTERS, Fan Belt, for Fords

(Spring attachment for keeping a uniform and constant tension on belt so that when adjustment is once made it will be automatically maintained)

Blough Mfg. Co., 112 N. Dexter St., Ionia, Mich. "Champion."

Champion—See Blough Mfg. Co.

Holmes, George L., 1733 Broadway, New York, N. Y. (Eastern Distributor for Swan Adjusters.) (See page 383.)

Mechanical Belt Co., 1205 Frederick Ave., St. Joseph, Mo. "Swan." (See page 101.)

Swan—See Mechanical Bolt Co.

ADJUSTERS, RIM—See Tools, Demountable Rim

ADJUSTERS, TIRE—See Tools, Tire

ADJUSTERS, VALVE—See Rods, Adjustable Valve Lift

ADJUSTERS, Valve Stem, for Fords

(For taking up wear and play between valve stem and push rod—See also Rods, Push)

Apco Mfg. Co., Eddy St., Providence, R. I.

Bowen Products Corp., Auburn Division, Auburn, N. Y. "Empress." (See page 237.)

Edelmann & Co., E., 341-63 E. Ohio St., Chicago, Ill.

Empress—See Bowen Products Corp.

Home Light Co., 3353 Milwaukee Ave., Chicago, Ill.

Humboldt Machine & Stamping Co., 81-85 Tenth St., Long Island City, N. Y.

Midway Mechanical Co., 1555 Selby Ave., St. Paul, Minn.

Nelson Mfg. Co., A., 2700 Southport Ave., Chicago, Ill.

P. & L.—See Parkhurst-Lavender Auto & Machine Co.

Parkhurst-Lavender Auto & Machine Co., Webster City, Ia. "P. & L."

Whitehouse-LeCompte Mfg. Co., 42-54 Elm St., Newark, N. J.

ADVERTISING AGENCIES—See Agencies, Advertising

AEROPLANES—See Section I

AGENCIES, Advertising

(Covering only Agencies who advertise in this publication)

Smith Co., Robert, Lansing, Mich. (See page 641.)

AGITATORS, MIXTURE—See Mixers, Fuel

AIR CLEANERS—See Cleaners, Air

AIR COCKS—See Cocks, Spring Key; also Cocks, Pet

AIR COMPRESSORS—See Pumps and Air Compressors

AIR GAGES—See Gages, Steam

AIR LINE TIRE CONNECTIONS—See Connections, Air System Tire

AIR MOISTENERS—See Moisteners, Air or Mixture

AIR NOZZLES—See Nozzles, Air Upholstery Cleaning

AIR PUMPS—See Pumps

AIR STARTERS—See Starters, Compressed Air

AIR WASHERS—See Cleaners, Air

ALARMS, BOILER—See Columns, Water

ALARMS, TAIL LIGHT—See Indicators, Tail Light

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ALARMS, Tire

(For sounding an alarm when tires are under or over inflated)

Gem—See Safety Tire Signal Co.

Pardue, John L. (Wellston Sta.), St. Louis, Mo.

Safety Tire Signal Co., 655 12th St., Boulder, Colo. "Gem."

Terpening, E. A., Mokena, Ill.

ALCOHOL, Denatured

(For use in Radiators to prevent water freezing; for other Anti-Freezing Mixtures—See Compounds, Anti-Freezing)

Jefferson Distilling & Denaturing Co., New Orleans, La. "Radico."

Pyro—See United States Industrial Alcohol Co.

Radico—See Jefferson Distilling & Denaturing Co.

United States Industrial Alcohol Co., 27 William St., New York, N. Y. "Pyro."

Woolner Distilling Co., ft. Spillman St., Peoria, Ill.

ALIGNERS, RUNNING GEAR—See Gages, Wheel Aligning

ALIGNING GAGES—See Gages, Wheel Aligning

ALLIGATOR WRENCHES—See Wrenches, Nut and Bolt

ALTERNATING CURRENT RECTIFIERS—See Rectifiers, Alternating Current

ALTIMETERS, Aircraft

(See also Barometers; also Barographs)

International Aeronautical Instrument Corp., 308 Madison Ave., New York, N. Y.

ALTITUDE INDICATING BAROMETERS—See Barometers, Altitude Indicating

ALUMINUM CASTINGS—See Castings, Aluminum

ALUMINUM MATTING—See Matting, Aluminum

ALUMINUM PAINTS—See Paints, Aluminum

ALUMINUM, Sheet and Rod

(For Aluminum Castings—See Castings, Aluminum; for Aluminum Tubing—See Tubing, Aluminum)

Aluminum Co. of America, Pittsburgh, Pa.

U. S. A.—See United Smelting & Aluminum Co.

United Smelting & Aluminum Co., 183-89 Commerce St., New Haven, Conn. "U. S. A."

ALUMINUM SOLDER—See Solder, Aluminum

ALUMINUM TUBING—See Tubing, Aluminum

AMMETERS and VOLTMETERS, Standard

(For switchboard and electric vehicle use; for Pocket or Dash Board Meters—See Gages, Battery)

Clark Electric Meter Co., 1330 12th St., Detroit, Mich.

General Electric Co., Schenectady, N. Y. (See pages 564 and 565.)

Gray-Heath Co., 1440 S. Michigan Ave., Chicago, Ill. (Sole Distributors for Jewell Electrical Instrument Co., Chicago, Ill.) (See Inside Back Cover.)

Harvard Electric Co., 525 W. Van Buren St., Chicago, Ill.

Hoyt Electrical Instrument Works, Penacook, N. H. (See page 507.)

Jewell Electrical Instrument Co.—See Gray-Heath Co.

Keystone Electrical Instrument Co., Wayne & Windrim Aves., Philadelphia, Pa.

Norton Electrical Instrument Co., Manchester, Conn.

Pignolet, Louis M., 78 Cortlandt St., New York, N. Y.

Queen-Gray Co., 616-18 Chestnut St., Philadelphia, Pa.

Reliance Instrument Co., 1185 Van Buren St., Chicago, Ill.

Roller-Smith Co., 233 Broadway, New York, N. Y.

Wagner Electric Mfg. Co., 6400 Plymouth Ave., St. Louis, Mo.

Weston Electrical Instrument Co., 16 Weston Ave., Newark, N. J. (See page 367.)

ANGLE BENDERS—See Benders, Angle

ANGLE STEEL—See Steel, Angle

ANGULAR BELTS—See Belts, V

ANNEALING—See Treating, Heat

ANNEALING FURNACES—See Furnaces, Annealing

ANNEALING AND HEAT TREATING—See Treating, Heat

ANNUNCIATORS, Automobile

(For signaling from passenger to driver; for Speaking Tubes—See Tubes, Speaking; for Limousine Telephones—See Telephones, Limousine)

O'Brien Mfg. Co., Joseph F., 391 Broadway, New York, N. Y.

ANTI-FREEZING RADIATOR—See Alcohol, Denatured; also Compounds, Anti-Freezing

ANTI-FREEZING SOLUTION—See Alcohol, Denatured; also Compounds, Anti-Freezing

ANTI-FRICTION METAL—See Metals, Bearing

ANTI-RATTLERS, Brake Rod Clevis, for Fords

(See also Supports, Brake Rod)

Affa Specialty Co., 84 Southbridge St., Worcester, Mass.

Apco Mfg. Co., Eddy St., Providence, R. I.

ANTI-RATTLERS, Door

(Rubber or Spring Bumpers to prevent the rattling of Car Doors)

Atwood Vacuum Machine Co., Church & Elm Sts., Rockford, Ill.

Bailey Co., W. J., Newark, N. J. "C. B."

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ANTI-RATTLERS, Door (Cont'd)

C. B.—See Bailey Co.

Fernald Mfg. Co., North East, Pa.

Ferro Stamping & Mfg. Co., 287-97 Franklin St., Detroit, Mich.

Mitchell Specialty Co., Market & 18th Sts., Philadelphia, Pa.

O'Brien Mfg. Co., Joseph F., 391 Broadway, New York, N. Y.

Puckett—See Western Auto Specialty Co.

Stadeker Metal Specialty Co., 358 W. Madison St., Chicago, Ill. (See page 271.)

Western Auto Specialty Co., Iowa City, Ia. "Puckett."

ANTI-RATTLERS, Door, for Fords

(Rubber or Spring Bumpers to prevent rattling of car doors)

Mosco—See Motor Specialties Co.

Motor Specialties Co., Pine St., Waltham, Mass. "Mosco."

ANTI-RATTLERS, Hood, for Fords

King Mfg. Co., 305 Washington St., Brookline, Mass.

ANTI-RATTLERS, MUD GUARD, FOR FORDS—See Braces, Mud Guard

ANTI-RATTLERS, Radius Rod, for Fords

(Adjustable cap to take place of solid cap on end of radius rod to permit taking up wear and so prevent rattling)

Crum-Wiley Mfg. Co., Peru, Ind.

Edelmann & Co., E., 341-63 E. Ohio St., Chicago, Ill.

Eureka Parts Co., 328 Central Ave., Dunkirk, N. Y.

Illinois Brass Mfg. Co., 226-30 W. Ontario St., Chicago, Ill.

Metal Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

Mosco—See Motor Specialties Co.

Motor Specialties Co., Pine St., Waltham, Mass. "Mosco."

Nelson Mfg. Co., A., 2700 Southport Ave., Chicago, Ill.

ANTI-RATTLERS, Spindle Arm, for Fords

(Small steel springs to place between spindle arm cross yoke end to prevent rattling)

Affa Specialty Co., 34 Southbridge St., Worcester, Mass.

Apco Mfg. Co., Eddy St., Providence, R. I.

Dunham Co., Thomas, Aurora, Ill. (See page 75.)

Eclipse Machine Co., Elmira, N. Y. (See page 345.)

King Mfg. Co., 305 Washington St., Brookline, Mass.

Metal Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

Sanborn Mfg. Co., J. W., Hampstead, N. H.

ANTI-RATTLERS, STEERING COLUMN, FOR FORDS—See Braces, Steering Column

ANTI-RATTLERS, Steering Rod, for Fords

(Adjustable spring cap to take place of solid cap on end of steering rod to permit taking up wear and so prevent rattling)

American Auto Products Co., 240-44 S. Broadway, Denver, Colo. "Little Giant."

Apco Mfg. Co., Eddy St., Providence, R. I.

B. A. T. Co., Germantown & Stenton Aves., Philadelphia, Pa. "Panther."

Crum-Wiley Mfg. Co., Peru, Ind.

E. G.—See Groesman Mfg. Corp.

Handy Mfg. Co., 15 Library St., Grand Rapids, Mich.

Humboldt Machine & Stamping Co., 31-35 Tenth St., Long Island City, N. Y.

Little Giant—See American Auto Products Co.

Mosco—See Motor Specialties Co.

Motor Specialties Co., Pine St., Waltham, Mass. "Mosco."

Nelson Mfg. Co., A., 2700 Southport Ave., Chicago, Ill.

Panther—See B. A. T. Co.

S & H. Anti Rattler Co., Liverpool, Pa.

Towle Mfg. Co., Portland, Me.

Whitehouse-LeCompte Mfg. Co., 42-54 Elm St., Newark, N. J.

ANTI-SKIDS, TIRE—See Bands, Non-Skid; also Chains or Grips; also Treads, Tire

ANTI-SQUEAK BODY—See Lining, Body or Frame

APRONS, Wash

Boko—See Defiance Welding Co.

Defiance Welding Co., Defiance Bldg., Defiance, O. "Boko."

Genesee Mfg. Co., 516-18 Harrison St., Flint, Mich.

Holden Mfg. Co., 409 N. Franklin Ave., St. Paul, Minn.

Martin Mfg. Co., Forest Rose Ave., Lancaster, O.

Motor Row Top Co., 1816-18 S. Fourth Ave., Rock Island, Ill. "Pearsons."

Pearson's—See Motor Row Top Co.

ARBOR PRESSES—See Presses, Arbor

ARBORS, EXPANDING—See Mandrels, Expanding

ARCH BARS—See Supports, Hood

ARCH PUNCHES—See Punches, Arch and Washer

ARMS, Crank Case Repair, for Fords

Hudson Motor Specialties Co., 1932 Arch St., Philadelphia, Pa.

ARTIFICIAL LEATHER—See Leather, Artificial

ARTILLERY WHEELS—See Wheels, Wood

ASBESTOS BRAKE LINING CUTTERS——See Cutters, Brake Banding

ASBESTOS GASKET—See Packing, Asbestos

ASBESTOS PACKING—See Packing, Asbestos

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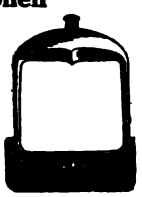

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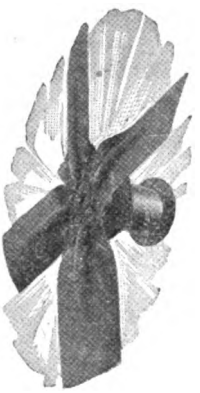

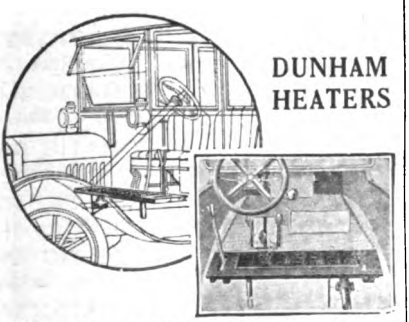

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ASBESTOS, Sheet

(For Asbestos Packing—See Packing, Asbestos)

Ambesco—See American Asbestos Co.

American Asbestos Co., 1219 Stanbridge St., Norristown, Pa. "Ambesco." (See page 415.)

J-M—See Johns-Manville Co.

Johns-Manville Co., H. W., Madison Ave. & 41st St., New York, N. Y. "J-M."

Keasbey & Mattison Co., Ambler, Pa.

Norristown Magnesia & Asbestos Co., Norristown, Pa.

Watson Co., H. F., Erie, Pa.

ASSEMBLIES, WIRING, FOR FORDS—See Sets, Wiring

ASSEMBLING CLAMPS FOR FORDS—See Clamps, Transmission Band Assembling

ATTACHMENTS, DUMMY FRAME, FOR FORDS—See Extensions, Dummy Frame

ATTACHMENTS, KEROSENE, FOR FORDS—See Carburetors, Kerosene; also Heaters, Mixture; also Manifolds, Special and Jacketed

ATTACHMENTS, Lathe Milling

Barnes Drill Co., 814-30 Chestnut St., Rockford, Ill.

Bicknell Mfg. & Supply Co., 22 N. Academy St., Janesville, Wis.

ATTACHMENTS, Magneto Mounting, for Fords

(Bracket and gear housing for attaching to Ford Motor to permit of the installation of any standard make of magneto)

Magneto Parts Co., 1790 Broadway, New York, N. Y. (See page 493.)

ATTACHMENTS, Power Transmitting

(Attachment to permit of the use of the car motor for general power purposes)

Auto-Motive Tractor Corp. of America, Southwest Bldg., Kansas City, Mo.

Auto Power & Malleable Mfg. Co., First Nat'l Bank Bldg., Omaha, Neb. "Wizard."

Auto Utilizer Co., 606-12 S. Pine St., Burlington, Wis.

Lay Porta Power—See Young Industries.

Powermaker Co., 21 W. 62d St., New York, N. Y.

Wizard—See Auto Power & Malleable Mfg. Co.

Young Industries, L. A., Westminster & Russel Sts., Detroit, Mich. "Lay Porta Power."

ATTACHMENTS, Power Transmitting, for Fords

(Attachment to permit of the use of the car motor for general power purposes)

Ashland Products Co., 50 E. Ninth St., Ashland, O. (See page 371.)

Auto Power & Malleable Mfg. Co., First Nat'l Bank Bldg., Omaha, Neb. "Wizard."

Auto Utilizer Co., 606-12 S. Pine St., Burlington, Wis.

Bayne Mfg. Co., Grant & Davis Sts., Bushnell, Ill.

Hickey, D. S., 40 Iffley Rd., Boston, Mass.

Ita Manufacturers, Glen Ellyn, Ill. (See page 495.)

Lay Porta Power—See Young Industries.

McCargar Mfg. Co., L. B. (N. Kansas City), Kansas City, Mo.

Powermaker Co., 21 W. 62d St., New York, N. Y.

Wizard—See Auto Power & Malleable Mfg. Co.

ATTACHMENTS, STEERING GEAR—See Checks, Steering Gear

ATTACHMENTS, Tilting Wheel, for Fords

(For converting regular Steering Wheel into a Tilting Wheel)

Eisen Instrument Co., Toledo, O.

Warner Electric Co., Walnut & 20th Sts., Muncie, Ind.

ATTACHMENTS, TIMER ELEVATING, FOR FORDS—See Brackets, Timer Elevating

ATTACHMENTS, TRACTOR, FOR FORDS—See Converters, Chassis

ATTACHMENTS, TRUCK—See Converters, Chassis

AUTOGENOUS WELDING—See Welding, Autogenous

AUTOGENOUS WELDING MACHINES—See Machines, Autogenous Welding

AUTOGRAPHIC REGISTERS—See Registers, Autographic and Manifold

AUTOMATIC BURNERS—See Burners, Special Acetylene Lamp

AUTOMATIC CLEVICES—See Clevices, Automatic Tractor Release

AUTOMATIC COUPLINGS—See Couplings, Automatic Spark Advancing

AUTOMATIC CUT-OUT SWITCHES—See Switches, Automatic Cut-Out

AUTOMATIC GEAR SHIFTERS—See See Shifters, Automatic Gear

AUTOMATIC HEADLIGHT BRACKETS—See Brackets, Automatic Headlight

AUTOMATIC RADIATOR COVERS—See Covers or Shields, Automatic Radiator

AUTOMATIC RADIATOR SHIELDS—See Covers or Shields, Automatic Radiator

AUTOMATIC REELS—See Reels, Automatic Extension

AUTOMATIC SCREW MACHINES—See Machines, Screw

AUTOMATIC SPARK RETARDERS FOR FORDS—See Retarders, Automatic Spark

AUTOMOBILES, GASOLINE, STEAM AND ELECTRIC—See Section I

AUXILIARY AIR VALVES—See Mixers, Fuel

AUXILIARY REAR AXLE BEARINGS FOR FORDS—See Bearings, Auxiliary Rear Axle.

AUXILIARY SPRINGS—See Springs, Supplementary

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AUXILIARY TRANSMISSION GEARS FOR FORDS—See Gears, Auxiliary Transmission

AVIATORS' CLOTHING—See Clothing, Aviators'; also Clothing, Electrically Heated Aviators

AVIATORS' GLOVES—See Gloves and Mittens, Aviators'

AVIATORS' MITTENS—See Gloves and Mittens, Aviators'

AVIATORS' PUTTEES—See Puttees, Aviators'

AVIATORS' SAFETY BUCKLES—See Buckles, Aircraft Safety

AXLE BEARINGS FOR FORDS—See Bearings, Auxiliary Rear Axle

AXLE BUSHINGS FOR FORDS—See Bushings, Bronze

AXLE ENDS—See Forgings, Drop

AXLE GREASE RETAINERS FOR FORDS—See Retainers, Rear Axle Grease

AXLE HOUSING PULLERS FOR FORDS—See Pullers, Axle Housing

AXLE SHAFTS—See Shafts, Rear Axle

AXLE SPINDLES FOR FORDS—See Spindles, Emergency Rear Axle

AXLE TRUSS RODS FOR FORDS—See Rods, Rear Axle Truss

AXLES, Front

(Finished or Machined Axles; for Axle Forgings—See Forgings, Drop)

Adams Axle Co., Findlay, O. (See page 83.)
American—See Standard Parts Co.
Columbia Axle Co., Cleveland, O. (See page 77.)
Gill & Sons Forge & Machine Works, P. H., Lorraine & Otsego Sts., Brooklyn, N. Y. (See page 239.)
Hess—See Western Spring & Axle Co.
Higgins Spring & Axle Co., Dept. 1015, Racine, Wis. (See page 639.)
Ladish Drop Forge Co., Cudahy, Wis. (See page 333.)
Liggett Spring & Axle Co., Monongahela, Pa.
Mott Wheel Works, Jackson, Mich.
Peru Auto Parts Mfg. Co., Peru, Ind. (See page 461.)
Rockford Machine Co., Rockford, Ill.
Russel Motor Axle Co., North Detroit, Mich.
Salisbury Wheel & Axle Co., Jamestown, N. Y. (See page opp. Last Page.)
Savage Arms Corp., Sharon, Pa. (See page 213.)
Sheldon Axle & Spring Co., Wilkes-Barre, Pa. (See pages 402 and 403.)
Shuler Axle Mfg. Co., Jones & N Sts., Louisville, Ky.
Spacke Machine & Tool Co., Indianapolis, Ind. (See page 427.)
Standard Parts Co., Cleveland, O. "American." (See pages 408 and 409.)
Timken-Detroit Axle Co., Detroit, Mich.
Torbenson Axle Co., Cleveland, O. (See page 81.)
Walker-Weiss Axle Co., Flint, Mich. (See page 789.)
Warren Machine Products Co., Warren, Pa. (See page 575.)
Western Spring & Axle Co., Garfield Bldg., Detroit, Mich. "Hess."
Weston-Mott Co., Flint, Mich.

AXLES, Rear

(Complete Rear Axle Units; for Axle Parts—See Specific Article)

Adams Axle Co., Findlay, O. "Simplex." (See page 83.)
Adco—See American Die & Tool Co.
American—See Standard Parts Co.
American Die & Tool Co., Reading, Pa. "Adco." (See page 317.)
Chicago Standard Axle Co., 1801 Belmont Ave., Chicago, Ill. "Standard." (See pages 79 and 80.)
Clark Equipment Co., Buchanan, Mich.
Columbia Axle Co., Cleveland, O. (See page 77.)
Cross Gear & Engine Co., 820 Bellevue Ave., Detroit, Mich. (See page 437.)
Empire Axle Co., Dunkirk, N. Y. (See page 83.)
Hayes Machinery Corp., E. B., 571 High St., Oshkosh, Wis. "Wisconsin."
Hess—See Western Spring & Axle Co.
Hindley Gear Co., 1105 Frankford Ave., Philadelphia, Pa.
Industrial Equipment Co., 223-25 Main St., San Francisco, Cal. "M. & W."
Keystone-Hindley Gear Co., 20th St. & Indiana Ave., Philadelphia, Pa.
Liggett Spring & Axle Co., Monongahela, Pa.
M. & W.—See Industrial Equipment Co.
Mott Wheel Works, Jackson, Mich.
Peru Auto Parts Mfg. Co., Peru, Ind. (See page 461.)
Rockford Machine Co., Rockford, Ill.
Russel Motor Axle Co., North Detroit, Mich.
Salisbury Wheel & Axle Co., Jamestown, (See page opp. Last Page.)
Savage Arms Corp., Sharon, Pa. (See page 213.)
Sheldon Axle & Spring Co., Wilkes-Barre, Pa. (See pages 402 and 403.)
Simplex—See Adams Axle Co.
Spacke Machine & Tool Co., Indianapolis, Ind. (See page 427.)
Standard—See Chicago Standard Worm Drive Axle Co.
Standard Parts Co., Cleveland, O. "American." (See pages 408 and 409.)
Timken-Detroit Axle Co., Detroit, Mich.
Torbensen Axle Co, Cleveland, O. (See page 81.)
Warren Machine Products Co., Warren, Pa. (See page 575.)
Western Spring & Axle Co., Garfield Bldg., Detroit, Mich. "Hess."
Weston-Mott Co., Flint, Mich.
Wisconsin—See Hayes Machinery Corp.

AXLES, Rear, with Transmission

(Complete Rear Axle and Transmission combined as a unit)

Adco—See American Die & Tool Co.
American Die & Tool Co., Reading, Pa., "Adco." (See page 317.)
Russel Motor Axle Co., North Detroit, Mich.
Salisbury Wheel & Axle Co., Jamestown, N. Y. (See page opp. Last Page.)

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STANDARD WORM DRIVE AXLE

STANDARD WORM DRIVE AXLE

Its Use is Proof of Quality

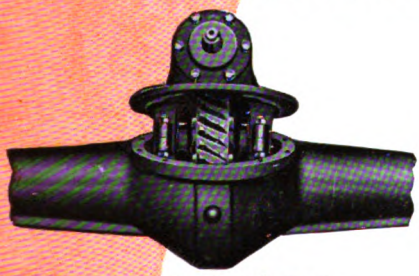


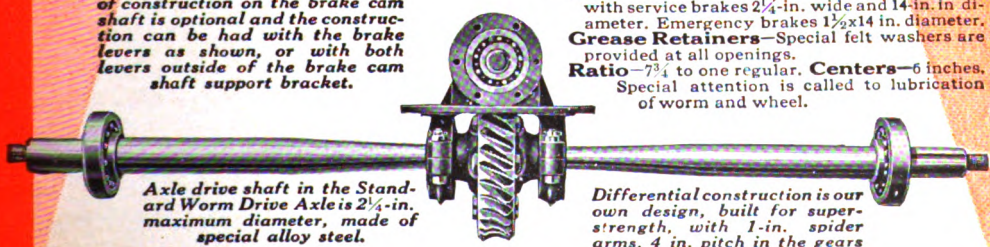
Illustration shows ease of removing cover of differential and gear housing.

STANDARD Worm Drive Axles now furnished in 1½ ton capacity embody new features of strength and correct engineering design that make them standard equipment on motor trucks built for quality.

Specifications

Materials—All material best obtainable.
Driving Shafts—Special alloy steel, heat-treated and accurately proportioned.
Housing—One-piece casting, thoroughly re-inforced, sand-blasted and free from blow holes and shrinkage cracks—machine molded and uniform thickness at all points.
Worm and Worm Wheel—Special steel worm and alloy bronze wheel. Worms and wheels tested on special machine. Center distance accurately measured. No special provision for keeping worms and wheels in pairs is necessary.
Differential—Differential gears and pinions are alloy steel, heat-treated with 1⅛-in. face and 4-in. pitch Differential spider has 1-in. diameter arms.
Bearings — Special self-contained, cone-type combined radial and thrust bearings at each end of worm shaft, and high duty radial and thrust bearings at each side of differential and outer shaft ends.
Mounting—Worm and wheel, together with differential, mounted as a unit on one-piece casting—worm wheel, worm shaft bearings, differential and differential bearings, can be removed as a unit.
Brakes — 2 pairs internal expanding brakes with service brakes 2¼-in. wide and 14-in. in diameter. Emergency brakes 1½x14 in. diameter.
Grease Retainers—Special felt washers are provided at all openings.
Ratio—7¾ to one regular. **Centers**—6 inches. Special attention is called to lubrication of worm and wheel.

Illustration shows assembly of brake cam shaft and brake cam shaft support bracket. The type of construction on the brake cam shaft is optional and the construction can be had with the brake levers as shown, or with both levers outside of the brake cam shaft support bracket.



Axle drive shaft in the Standard Worm Drive Axle is 2¼-in. maximum diameter, made of special alloy steel.

Differential construction is our own design, built for super-strength, with 1-in. spider arms, 4 in. pitch in the gears and 1⅛-in. face on the gears.

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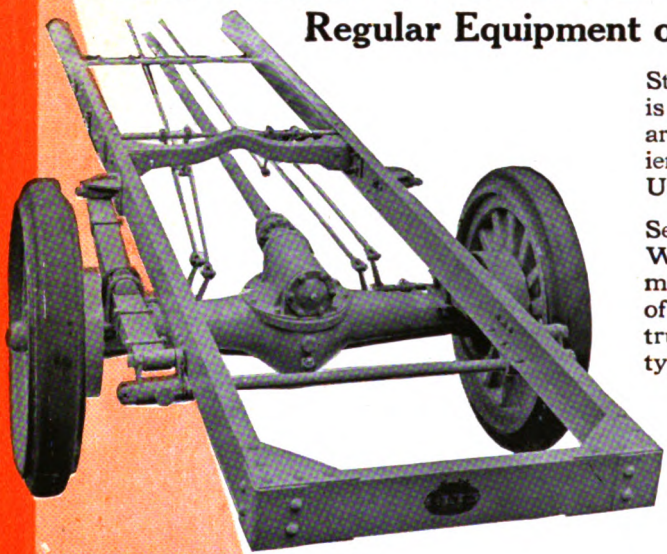
Standard Worm Drive Axle

Regular Equipment on Quality Trucks



Standard Worm Drive Axle is now furnished as standard equipment on the heavier capacity E. & W. Truck Units.

Selection of the Standard Worm Drive Axle was made after exhaustive tests of nearly every make of truck axle, including all types of design.

The strength and sturdiness of the Standard Worm Drive Axle was proved by service records covering nearly every kind of truck work under practically every operating condition.

These Three Features Alone Take the Standard Axle Out of Competition

Malleable Axle Housing

The axle housing in the Standard Worm Drive Axle is a malleable casting specially annealed by a patented process — the annealing requires from ten to fifteen days and gives a housing that is free from blow holes, that is annealed throughout and free from "case" on the outer surface.

Oversize Differential

The differential in the Standard Worm Drive Axle is built over-size to our own specifications for maximum strengh. This feature alone is of such value in service that it is one of the most definite reasons for the use of the Standard axle.

Grease Cups for Brake Levers

Lubrication of the brake lever is necessary in axle construction yet Standard Worm Drive Axle is the first to equip with regulation oiling facilities. The position of the brake lever is optional — the Standard Worm Drive Axle fits any truck without necessity for rebuilding the brake equipment.

Order Early to Insure Delivery

Early orders are necessary to insure delivery. The material market and the volume of business we are now handling makes it impossible for us to assure delivery other than on orders which are placed immediately.

CHICAGO STANDARD AXLE COMPANY

1801 Belmont Avenue — Chicago, Illinois

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STANDARDIZATION

IS THE BIGGEST WORD
IN AMERICA'S INDUSTRIAL
VOCABULARY

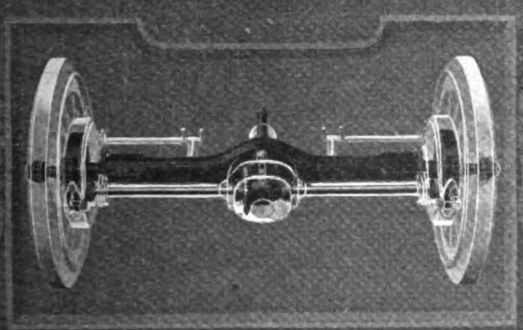
FOR MOTOR TRUCKS

TORBENSEN

INTERNAL GEAR
TRUCK DRIVE

IS ABSOLUTELY STANDARD

MORE THAN SIXTY THOUSAND - ALL ONE DESIGN -
NOW GIVING SATISFACTORY SERVICE IN THIS
COUNTRY



THE TORBENSEN AXLE CO.
CLEVELAND, OHIO
LARGEST BUILDER IN THE WORLD OF REAR AXLES FOR MOTOR TRUCKS

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AXLES, Special Trailer

(Finished or Machined Trailer Axles; for Trailer Axle Forgings—See Forgings, Drop)

American Axle Co., 12th St. & Montgomery Ave., Philadelphia, Pa.

Auto Engineering Co., 429-31 Bagg St., Detroit, Mich. (See page 83.)

Concord Axle Co., Penacook, N. H.

Illinois Iron & Bolt Co., Carpentersville, Ill

Martin Rocking Fifth Wheel Co., Springfield, Mass. (See page 759.)

Shuler Axle Mfg. Co., Jones & N Sts., Louisville, Ky.

AXLES, Tractor

(See also Axles, Front; also Axles, Rear)

Milwaukee Forge & Machine Co., 340 Oklahoma Ave., Milwaukee, Wis.

AXLES, Worm Drive Rear, for Fords

McIntyre Motor Products Co., 100-10 W. 55th St., Chicago, Ill.

BABBITT BEARINGS—See Metals, Bearing

BABBITT MELTING FURNACES—See Furnaces, Babbitt Melting

BABBITT METAL—See Metals, Bearing

BABBITTING JIGS FOR FORDS—See Jigs, Connecting Rod Babbitting

BABY HAMMOCKS—See Hammocks, Baby

BACK RESTS—See Rests, Cushion Back; also Rests, Motorcycle Back

BACKS, Metal Seat

(For Wood Seat Backs—See Bendings, Wood)

A. Z. Co., 530 W. 56th St., New York, N. Y. (See page 563.)

American Automobile Accessories Co., B. & O. R. R. & Blue Rock St., Cincinnati, O. "3 A."

Cornwall Mfg. Co., E. 128th St. & Penobscot Ave., Cleveland, O.

Lawco—See Lawson Co.

Lawson Co., F. H., Dept. D, Cincinnati, O. "Lawco." (See page 663.)

Mullins Co., W. H., 182 Franklin St., Salem, O.

3A—See American Automobile Accessories Co.

BAGS, Coat Rail

(Small Fabric or Leather Bags to be hung on Robe or Coat Rails for carrying gloves, goggles or other articles)

Ajax Trunk & Sample Case Co., 144-50 W. 18th St., New York, N. Y.

Atlas Specialty Mfg. Co., 16-22 E. 24th St., Chicago, Ill. (See page 123.)

B. E. Mfg. Co., 18-22 W. 18th St., New York, N. Y. (See page 223.)

Buffington & Co., C. A., Berkshire, N. Y.

Gilbert Mfg. Co., 70-80 Center St., New Haven, Conn.

Nathan Novelty Mfg. Co., 84-90 Reade St., New York, N. Y. (See page 153.)

Niagara Fabric Mfg. Co., 47 Greene St., New New York, N. Y.

Winship, W. W., 71 Summer St., Boston, Mass.

BAGS, GAS—See Bags, Rubber Gas

BAGS, GREASE—See Boots, Steering Knuckle

BAGS, INNER TUBE—See Cases, Tire

BAGS, Luggage, for Fords

(For attaching to back of front seats)

Atlas Specialty Mfg. Co., 16-22 E. 24th St., Chicago, Ill. (See page 123.)

Nathan Novelty Mfg. Co., 84-90 Reade St., New York, N. Y. (See page 153.)

BAGS, ROBE RAIL—See Bags, Coat Rail

BAGS, Rubber Gas

(Small Rubber Bags to be attached to Acetylene Headlights to equalize the flow of gas to the lamp and prevent flickering)

Davol Rubber Co., Providence, R. I.

Indiana Rubber & Insulated Wire Co., Jonesboro, Ind.

Mechanical Rubber Co., C. & P. & Nickel Plate R. R., Cleveland, O.

Seamless Rubber Co., 534 Congress Ave., New Haven, Conn.

Tyer Rubber Co., Andover, Mass. "Tyrian."

Tyrian—See Tyer Rubber Co.

BAGS, Shipping

Bemis Bro. Bag Co., 700 S. Fourth St., St. Louis. Mo.

Bull Dog—See National Bag Co.

Central Bag Mfg. Co., 3622-30 Iron St., Chicago, Ill.

Champion Bag Co., 210 E. 23rd St., New York, N. Y.

Chase Bag Co., St. Louis, Mo.

Cleveland-Akron Bag Co., E. 40th St. & Perkins Ave., Cleveland, O.

Milwaukee Bag Co., Milwaukee, Wis.

National Bag Co., 107 Main St., Aurora, Ill. "Bull Dog."

Williamsville Buff Mfg. Co., 24 School St., Danielson, Conn.

BAGS, Steam Tire Curing

K. & W. Rubber Co. of Colo., Denver, Colo. "Twentieth Century."

Twentieth Century—See K. & W. Rubber Co. of Colo.

BAGS, TUBE—See Covers, Spare Tire

BAGS or ROLLS, Tool

(For Tool Boxes—See Boxes, Tool)

Atlas Specialty Mfg. Co., 16-22 E. 24th St., Chicago, Ill. (See page 123.)

B. E. Mfg. Co., 18-22 W. 18th St., New York, N. Y. (See page 223.)

Bemis Bro. Bag Co., 700 S. Fourth St., St. Louis, Mo.

Boyle & Co., John, 112-14 Duane St., New York, N. Y.

Campbell—See Perkins Campbell Co.

Chicago Wholesale Saddlery & Mfg. Co., 125-27 N. Halsted St., Chicago, Ill.

Cook & Bro., E. C., 1301-45 Carroll Ave., Chicago. Ill.

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ADAMS AXLES

Models C and D—Front Axles
Variable spring centres, drop and bearing equipment.

REAR AXLES

Model C—Long third member, variable length and spring centre.

Model D—Short third member, variable spring centre.

LARGE RANGE, GEAR RATIOS AND BEARING EQUIPMENT, RANGE OF CARWEIGHTS—2200 TO 2800 POUNDS.

The experience gained in co-operating with many manufacturers, the expert knowledge gained by years of experience is at the command of every one who desires to simplify the axle problem and secure the maximum of results.

General Production

Government machine work solicited. Heavy duty equipment and light equipment.

ADAMS AXLE CO.
Findlay Ohio

TRAILER AXLES

Equipped with Hubs and Timken Roller Bearings

ALL SIZES

1⅛ inch to 3 inch. Round, Rectangular or Square, any track desired.

CONTRACT MACHINE WORK

The Auto Engineering Company
429-431 Bagg Street
Detroit, Mich.

EMPIRE AXLES

1 Ton
2½ Ton

3½ Ton
5 and 7 Ton

WORM DRIVE

EMPIRE AXLE COMPANY
DUNKIRK, N. Y.

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BAGS or ROLLS, Tool (Continued)

Dafoe-Eustice Co., 1164-72 W. Jefferson Ave., Detroit, Mich. "Duk-Bak," "Deco." (See page 227.)

Deco—See Dafoe-Eustice Co.

Duk-Bak—See Dafoe-Eustice Co.

Economy Stay Co., Jefferson City, Mo.

Ero Mfg. Co., 700 W. 22nd St., Chicago, Ill.

Excelsior Bag & Mfg. Co., Troy, N. Y.

Feeser Co., Frank S., 1102 Prospect St., Indianapolis, Ind. "Superior."

Gilbert Mfg. Co., 70-80 Center St., New Haven, Conn.

Goss Co., J. C., 16 Woodbridge St., E., Detroit, Mich.

Invincible—See Peters & Herron Dash Co.

Landers Bros. Co., Blucher & Buckingham Sts., Toledo, O.

Nathan Novelty Mfg. Co., 84-90 Reade St., New York, N. Y. (See page 153.)

Niagara Fabric Mfg. Co., 47 Greene St., New York, N. Y.

Perkins-Campbell Co., 634 Broadway, Cincinnati, O. "Campbell." (See page 227.)

Peters & Herron Dash Co., Gift St., Columbus, O. "Invincible."

Planet Co., 180 N. Elm St., Westfield, Mass.

Powers Mfg. Co., 1340 Sycamore St., Waterloo, Ia.

Premier Auto Novelty Mfg. Co., 375 W. Broadway, New York, N. Y.

Springfield Harness Co., 55-61 Dwight St., Springfield, Mass.

Superior—See Feeser Co.

Warner Auto Top Co., 1622-26 Central Ave., Cincinnati, O.

BAGS, Water Carrying

(For carrying a supply of water on long trips; for Buckets or Pails for filling Radiators—See Buckets, Collapsible)

Egyptian—See Whitaker Mfg. Co.

Strong Bungalow Co., 226 Edgewood St., Hartford, Conn.

Whitaker Mfg. Co., 409 S. Green St., Chicago, Ill. "Egyptian."

BAILERS, Motor Boat Automatic Bilge

(See also Pumps, Engine Driven Bilge)

Automatic Bilge Bailer Co., 999 Beacon St., Brookline, Mass. "Hitchcocks."

Hitchcocks—See Automatic Bilge Bailer Co.

BALANCING MACHINES—See Machines, Balancing

BALANCING WAYS—See Ways, Balancing

BALL BEARINGS—See Bearings, Ball

BALL BEARINGS, REGROUND—See Bearings, Reground Ball

BALL CHECK VALVES—See Valves, Ball Check

BALL CONES—See Cups, Ball

BALL CUPS—See Cups, Ball

BALL JOINTS—See Joints, Ball

BALL RACES—See Cups, Ball

BALL RETAINERS—See Retainers, Ball

BALL SOCKETS FOR FORDS—See Anti-Rattlers

BALL THRUST BEARINGS FOR FORDS—See Bearings, Drive Gear Ball Thrust

BALLOONS, DIRIGIBLE—See Section I

BALLOONS, Spherical

Knabenshue Aircraft Corp., 140 W. 42d St., New York, N. Y.

BALLS, Composition Control Lever

(Moulded Composition Balls or Knobs for Gear Shift Levers)

Pouvailsmith Corp., Poughkeepsie, N. Y.

BALLS, STEEL

(For use in Ball Bearings; for complete Bearings—See Bearings, Ball)

Abbott Ball Co., Railroad St., Elmwood, Conn.

Atlas Steel Ball Co., Glenwood Ave. & Fourth St., Philadelphia, Pa.

Auburn Ball Bearing Co., 27 Elizabeth St., Rochester, N. Y. (See page 87.)

Fulton Mfg. Co., Toledo, O.

Gwilliam Co., 253 W. 58th St., New York, N. Y. (Dealers.) (See page 89.)

Hoffman—See R. I. V. Co.

Hoover Steel Ball Co., Ann Arbor, Mich. (See page 85.)

Metal Specialty Mfg. Co., E. Aurora St., Waterbury, Conn. "Wamsco."

New Departure Mfg. Co., Bristol, Conn. (See page 95.)

New York Bearings Co., 311 W. 59th St., New York, N. Y. (See page 127.)

R. I. V. Co., 254 W. 57th St., New York, N. Y. (Importers.) "Hoffman."

Standard Roller Bearing Co., Philadelphia, Pa. (See page 113.)

Wamsco—See Metal Specialty Mfg. Co.

BAND ASSEMBLING CLAMPS FOR FORDS—See Clamps, Transmission Band Assembling

BAND BRAKES—See Brakes, Expanding and Contracting

BAND SAWS—See Saws, Band

BANDAGE WRAPPING MACHINES—See Machines, Tire Bandage Wrapping

BANDING, BRAKE—See Lining, Brake

BANDING CUTTERS—See Cutters, Brake Lining

BANDING TRANSMISSION FOR FORDS—See Lining, Brake

BANDS, Non-Skid

(See also Treads, Detachable; for Tire Chains—See Chains, Tire)

Bukolt Mfg. Co., Stevens Point, Wis. "Highway."

Highway—See Bukolt Mfg. Co.

Woodworth Mfg. Corp., Niagara Falls, N. Y. (See page 721.)

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FIGHTING EFFICIENCY RESTS ON INDUSTRY

From the dictionary of every red blooded man and woman in these United States the word "can't" has been eliminated.

That America CAN—
is proven by the onrush of our mighty army—an avenging giant Nemesis of an outraged world.

That America CAN—
is demonstrated by the stupendous output of her massed industries under the spur of our country's gigantic war requirements.

Yet, like her army, America's industries are still in leash. They have not fully extended themselves. Daily our huge production creative powers reflect the quickening impulse of a grim national determination.

And, in practically every speeding shop and factory throughout the land, Hoover Steel Balls—those silent enemies of mechanical friction, are contributing much to the potential efficiency of industry without which the fighting arm of this great Democracy would indeed be paralyzed.

HOOVER

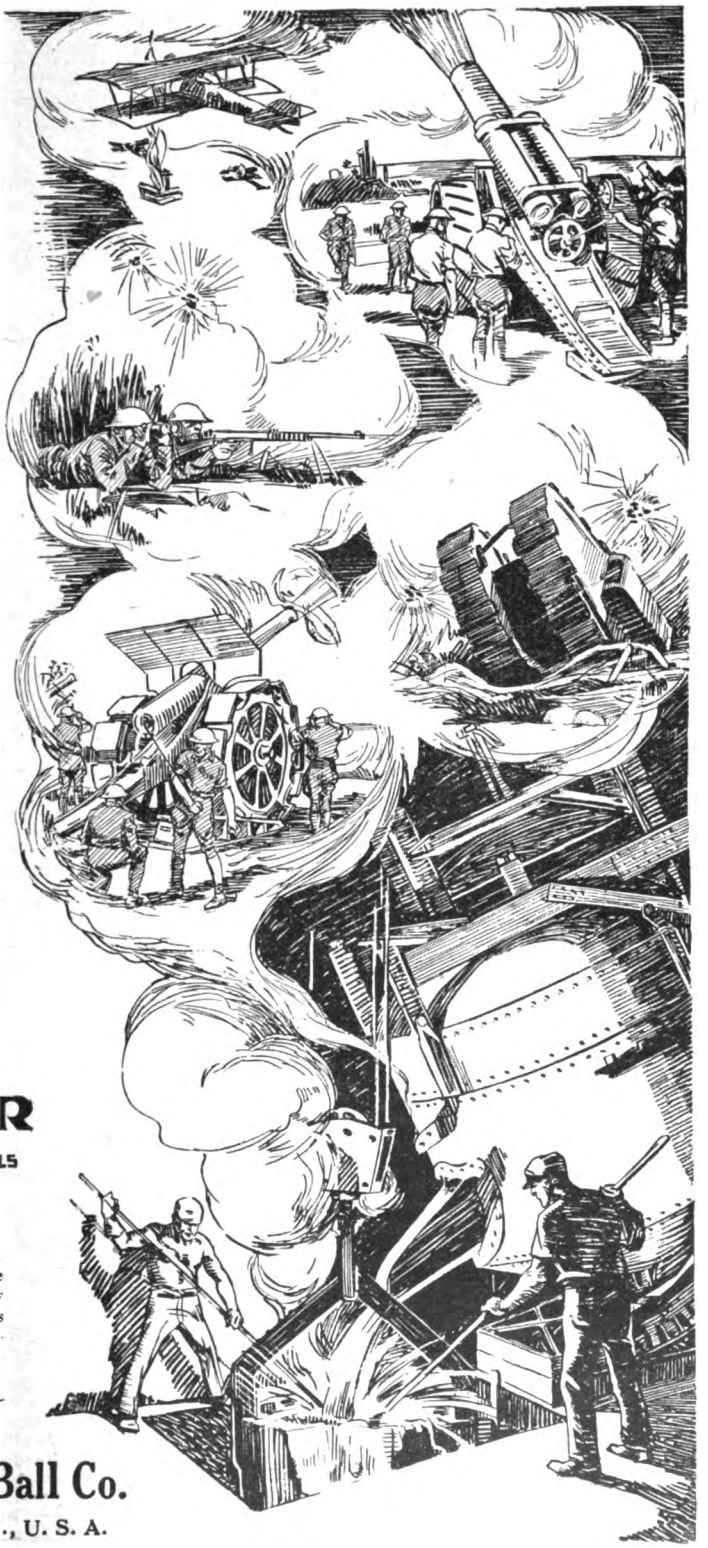
STEEL BALLS

Measured by the unit of ¼ in. balls the output of the Hoover Steel Ball Plants now exceeds 30,000,000 steel balls daily—or 10,950,000,000 annually.

Obviously trade demand governs production.

Hoover Steel Ball Co.

ANN ARBOR, MICH., U. S. A.



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BANDS, TIRE REPAIR—See Sleeves, Tire Repair

BANDS, Transmission, for Fords

(Steel band with lugs attached for low speed and reverse gears and for transmission brake)

Gemco Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. (See page 135.)

Metal Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

BANKING INDICATORS, AEROPLANE—See Indicators, Banking

BAR CUTTERS—See Cutters, Rod and Bar

BAR SOLDER—See Solder, Bar and Wire

BAR STEEL—See Steel

BAROGRAPHS, Aircraft Recording

(See also Altimeters; also Barometers)

Green, Henry J., 1191 Bedford Ave., Brooklyn, N. Y.

International Aeronautical Instrument Corp., 308 Madison Ave., New York, N. Y.

BAROMETERS, Aircraft

(See also Altimeters; also Barographs)

Taylor Instrument Cos., 95 Ames St., Rochester, N. Y.

BAROMETERS, Altitude Indicating

(For Dash Attachment)

Bernard, F. J., 64 Murray St., New York, N. Y.

BARRELS, SHOP—See Boxes, Sheet Metal Tote

BARS, ARCH—See Supports, Hood

BARS, Boring

Allen & Curtiss Co., W. Main St., Benton Harbor, Mich. "Simpl."

Armstrong Bros. Tool Co., 304 N. Francisco Ave., Chicago, Ill. (See page 773.)

Carr—See Thompson & Son Co.

Clough, R. M., Tolland, Conn.

Davis Boring Tool Co., 3722 Forest Park Blvd., St. Louis, Mo.

Krieger Tool & Mfg. Co., Grand Rapids, Wis.

Marvin & Casler Co., 118 Roberts St., Canastota, N. Y.

O. K. Tool Holder Co., Shelton, Conn.

Ready Tool Co., 624 Iranistan Ave., Bridgeport, Conn. "Red-E."

Red-E—See Ready Tool Co.

Rigid Tool Holder Co., 149 Carroll St., S. E., Washington, D. C.

Simpl—See Allen & Curtiss Co.

Thompson & Son Co., Henry G., 492 State St., New Haven, Conn. "Carr."

Universal Boring Machine Co., 20 Tower St., Hudson, Mass.

Woods Engineering Co., 108 E. Patterson St., Alliance, O.

BARS, CORED—See Metals, Bearing

BARS, HANDLE—See Bars, Motorcycle Handle

BARS, Motorcycle Handle

Chicago Handle Bar Co., Shelby, O.

BASKETS, TOURING—See Hampers, Touring

BATTERIES, Dry

American Carbon & Battery Co., East St. Louis, Ill.

American Ever Ready Works, Thomson Ave. & Orton St., Long Island City, N. Y. "Everready."

Andrae & Sons Co., Julius, Broadway & Michigan Sts., Milwaukee, Wis. "Sparko."

Autocrat—See Stackpole Carbon Co.

Bright Star Battery Co., 310 Hudson St., New York, N. Y.

Bull Dog—See Western Dry Battery Co.

Burgess Battery Co., 111 W. Monroe St., Madison, Wis.

Columbia—See National Carbon Co.

Eveready—See American Ever Ready Works.

Fleur-De-Lis—See French Battery & Carbon Co.

French Battery & Carbon Co., Madison, Wis. "Fleur-de-Lis." (See page 395.)

Hi-Po Waterproof Battery Corp., South Norwalk, Conn.

Hi-Up—See Manhattan Electrical Supply Co.

Hot Shot—See National Carbon Co.

Manhattan Electrical Supply Co., 17 Park Pl., New York, N. Y. "Red Seal," "Hi-Up."

Master—See United Battery Corp.

National Carbon Co., Cleveland, O. "Columbia," "Hot Shot." (See page 131.)

Nue—See Union Battery Co.

Power—See Union Battery Co.

Red Seal—See Manhattan Electrical Supply Co.

Red Shield—See Wesco Supply Co.

Red Star—See White Star Battery Co.

Sparko—See Andrae & Sons Co.

Stackpole Carbon Co., St. Marys, Pa. "Autocrat," "Wizard."

Union Battery Co., Belleville, N. J. "Nue," "Power."

United Battery Corp., Woolworth Bldg., New York, N. Y. "Master."

Universal Carbon Co., First St. & Riverside Ave., Dundee, Ill.

Washington Automobile Supply Co., Washington, Ill.

Wesco Supply Co., Seventh St. & Clark Ave., St. Louis, Mo. "Red Shield."

Western Dry Battery Co., 2225-31 First Ave., S., Seattle, Wash. "Bull Dog."

White Star Battery Co., 126 Chambers St., New York, N. Y. "Red Star."

Wizard—See Stackpole Carbon Co.

BATTERIES, Storage

Ajax-Accumulator Co., 414 Rush St., Chicago, Ill.

American Battery Co., 1132-34 Fulton St., Chicago, Ill. "Invincible."

American Ever Ready Works, Thomson Ave. & Orton St., Long Island City, N. Y. "Geiszler," "Midget," "Eveready."

American Storage Battery Co., Cambridge, Mass. "Harvard."

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Willard Service.

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State your problem or ask for bulletins

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BATTERIES, Storage (Continued)

Ampvo Battery Co., 3031 Michigan Ave., Chicago, Ill.

Ashbrook Electric Co., 4111 Ravenswood Ave., Chicago, Ill. "Satisfaction."

Brown-Smith Battery Co., Bloomington, Ind.

Century Storage Battery Co., Detroit, Mich. (See page 127.)

Cincinnati Storage Battery Co., 228-30 Stark St., Cincinnati, O.

Cole Storage Battery Co.., 219-21 E. 24th St., Chicago, Ill.

Columbia—See National Carbon Co.

Combat—See Commercial Battery Co.

Commercial Battery Co., 759-61 Boston Ave., Chicago, Ill. "Combat."

Cook Railway Signal Co., 1793 S. Broadway, Denver, Colo. "Re Vivo."

Davis-Lynn Storage Battery Mfg. Co., 486 Chestnut St., Lynn, Mass.

Detroit Battery Co., 112 E. High St., Detroit, Mich.

Edison Storage Battery Co., 181 Lakeside Ave., Orange, N. J.

Electric Storage Battery Co., Allegheny Ave. & 19th St., Philadelphia, Pa. "Exide," "Hycap-Exide."

Electric Storage Battery & Mfg. Co., Cincinnati, O. "Hydrox."

Essex Storage Battery & Supply Co., 272 Halsey St., Newark, N. J.

Eveready—See American Ever Ready Works.

Exide—See Electric Storage Battery Co.

G. L. B—See General Lead Batteries Co.

Gardiner Storage Battery Co., 42-48 E. 51st St., Chicago, Ill.

Geiszler—See American Ever Ready Works.

General Lead Batteries Co., Chapel St. & Lister Ave., Newark, N. J. "G. L. B."

General Storage Battery Co., 2005 Locust St., St. Louis, Mo.

Gould Storage Battery Co., 30 E. 42d St., New York, N. Y. (See page 87.)

Harvard—See American Storage Battery Co.

Heissler Storage Battery Co., 1436 Michigan Blvd., Chicago, Ill. "Hytork."

Hudson-Fulton—See Storage Battery Supply Co.

Hycap-Exide—See Electric Storage Battery Co.

Hydrox—See Electric Storage Battery & Mfg. Co.

Hytork—See Heissler Storage Battery Co.

Invincible—See American Battery Co.

Keeler Battery Co., 134 Ontario St., Toledo, O.

Koener Battery Mfg. Industry, 1141 Wolfram St., Chicago, Ill.

LBA—See Willard Storage Battery Co.

McCauley Storage Battery Co., 1060 St. Clair Ave., E., Cleveland, O.

Marko & Co., Paul M., 1191 Bedford Ave., Brooklyn, N. Y.

Masco—See Milwaukee Auto Specialty Co.

Mentzer & Co., J. P., 134 S. La Salle St., Chicago, Ill.

Michigan Storage Battery Co., 67 Atwater St., Detroit, Mich.

Midget—See American Ever Ready Works.

Milwaukee Auto Specialty Co., 705-15 Chestnut St., Milwaukee, Wis. "Radium," "Masco."

Mound City Battery Co., 17 S. Boyle St., St. Louis, Mo.

Muller, Albert, Hoffman Blvd. & Hillside Ave., Jamaica, N. Y. "Porox."

Multiple Storage Battery Co., 427 W. 50th St., New York, N. Y.

National Carbon Co., Cleveland, O. "Columbia." (See page 131.)

Perfection Storage Battery Co., 2901-09 Indiana Ave., Chicago, Ill.

Permalife Storage Battery Co., Poughkeepsie, N. Y. (See page 487.)

Philadelphia Storage Battery Co., Ontario & C Sts., Philadelphia, Pa.

Porox—See Muller, Albert.

Premier Electric Co., 4034 Ravenswood Ave., Chicago, Ill.

Prest-O-Lite Co., Indianapolis, Ind. (See page 89.)

Radium—See Milwaukee Auto Specialty Co.

Reliable—See Storage Battery Supply Co.

Reliance—See Storage Battery Supply Co.

S. O. S.—See Victor Storage Battery Co.

Salom Electric Storage Battery Corp., Niagara Falls, N. Y.

Satisfaction—See Ashbrook Electric Co.

Silvey Electric Co., 10-16 S. Canal St., Dayton, O.

Storage Battery Supply Co., 239 E. 27th St., New York, N. Y. "Reliance," "Reliable," "Hudson-Fulton."

U-S-L—See U S Light & Heat Corp.

U S Light & Heat Corp., Niagara Falls, N. Y. "USL." (See page 89.)

Universal Battery Co., 3410-24 S. La Salle St., Chicago, Ill.

Utility Battery Co., 123 W. Madison St., Chicago, Ill.

Vesta Accumulator Co., 2100 Indiana Ave., Chicago, Ill.

Victor Storage Battery Co., 2400 Fourth Ave., Rock Island, Ill. "S. O. S."

Volkcar Storage Battery Co., 2441 Michigan Ave., Chicago, Ill.

Wico—See Witherbee Storage Battery Co.

Willard Storage Battery Co., Cleveland, O. "Lba." (See page 87.)

Witherbee Storage Battery Co., Springfield, Mass. "Wico."

Zoar Battery Co., Zoar, O.

BATTERY ACID—See Electrolyte, Storage Battery

BATTERY BOX LOCKS—See Locks, Cabinet and Pad; also Catches, Spring

BATTERY BOXES—See Boxes, Battery

BATTERY CHARGERS—See Magnetos and Dynamos; also Dynamos, Battery Charging; also Rectifiers, Alternating Current; also Rheostats, Charging; also Systems, Electric Lighting

BATTERY CHARGING PLUGS—See Plugs, Charging

BATTERY CONNECTIONS—See Connectors, Battery

BATTERY ELECTROLYTE—See Electrolyte, Storage Battery

BATTERY GAGES—See Gages, Battery

BATTERY HOLDERS—See Holders, Battery; also Boxes, Battery

BATTERY JARS—See Jars, Battery

BATTERY METERS—See Gages, Battery

BATTERY PLATE PRESSES—See Presses, Storage Battery Plate

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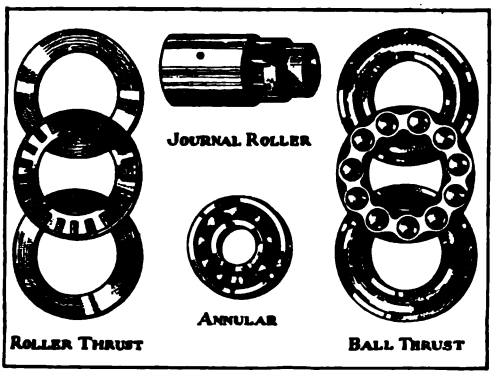

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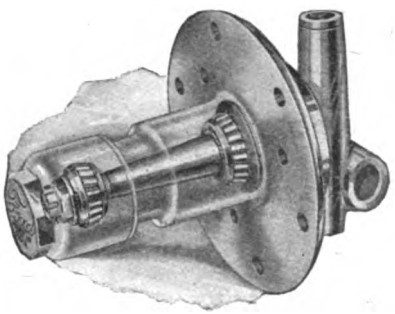

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BATTERY SEPARATORS—See Separators, Storage Battery

BATTERY STEAMERS—See Steamers, Storage Battery

BATTERY SWITCHES—See Switches

BATTERY TESTERS—See Gages, Battery

BATTERY TURNTABLES—See Turntables, Storage Battery

BEADING MACHINES—See Machines, Crimping and Beading

BEAMS, AEROPLANE—See Parts, Wood

BEARING BRONZE—See Metals, Bearing

BEARING METALS—See Metals, Bearing

BEARING PULLING TOOLS—See Pullers, Bearing

BEARING PULLERS—See Pullers, Bearing

BEARING REAMERS FOR FORDS—See Reamers, Main Bearing

BEARING SCRAPERS—See Scrapers, Bearing

BEARINGS, Auxiliary Rear Axle, for Fords

(Special bearings to be mounted on outer ends of rear axle housing to permit of heavier loads being carried)

Hercules Auxiliary Bearing Works, 327 S. La Salle St., Chicago, Ill.

BEARINGS, BABBITT—See Metals, Bearing

BEARINGS, Ball

(For Bearing Parts—See Balls, Steel; also Cups, Ball; also Retainers, Ball)

Aetna Ball Bearing Mfg. Co., 218 Institute Pl., Chicago, Ill.

American Ball Co., 115 Clifford St., Providence, R. I.

Auburn Ball Bearing Co., 27 Elizabeth St., Rochester, N. Y. (See page 87.)

Ball & Roller Bearing Co., 22 Maple Ave., Danbury, Conn.

Bantam Ball Bearing Co., Bantam, Conn.

Bearings Co. of America, Lancaster, Pa. (See page 125.)

Carlson-Wenstrom Co., Richmond St. & Erie Ave., Philadelphia, Pa. "Carwen."

Carwen—See Carlson-Wenstrom Co.

D. W. F.—See Hess-Bright Mfg. Co.

Fafnir Bearing Co., New Britain, Conn. (See page 337.)

Federal Bearings Co., 26 William St., Poughkeepsie, N. Y. "Schatz."

G-A Ball Bearing Co., Lake & Albany Sts., Chicago, Ill.

Graham Roller Bearing Co., Coudersport, Pa.

Gurney Ball Bearing Co., 402 Chandler St., Jamestown, N. Y.

Gwilliam Co., 253 W. 58th St., New York, N. Y. (Metropolitan Distributors for Nice, New Departure and "S R B" Ball Bearings.) (See page 89.)

H-B—See Hess-Bright Mfg. Co.

Hess-Bright Mfg. Co., Philadelphia, Pa. "H-B," "D. W. F." (See Book Mark.)

Imperial Bearing Co., E. Forest Ave., Detroit, Mich.

Iron City Products Co., Pittsburgh, Pa. (Thrust Bearings Only.) (See pages 579 and 580.)

Marburg Bros., 90 West St., New York, N. Y. (Importers.) "S. R. O."

Mathews Mfg. Co., H. A., Seymour, Conn.

New Departure Mfg. Co., Bristol, Conn. (See page 95.)

New York Bearings Co., 311 W. 59th St., New York, N. Y. (Dealers.) (See page 127.)

Nice Ball Bearing Co., 30th St. & Nicetown Lane, Philadelphia, Pa.

Norma Co. of America, 1790 Broadway, New York, N. Y. (See page 68.)

Pruyn Ball Bearing Works, 4408-10 Paul St., Philadelphia, Pa. (See page 117.)

R. I. V. Co., 254 W. 57th St., New York, N. Y. (Importers.)

R. W. F.—See Riebe Ball Bearing Co.

Riebe Ball Bearing Co., 1790 Broadway, New York, N. Y. (Importers.) "R. W. F."

Rockwell-Drake Corporation, Plainville, Conn.

SKF Ball Bearing Co., Hartford, Conn. (See page 97.)

S R B—See Standard Roller Bearing Co.

S R O—See Marburg Bros.

Schatz—See Federal Bearings Co.

Schneider Ball Bearing Mfg. Co., Stefan, 1821-23 Berteau Ave., Chicago, Ill.

Standard Machinery Co., Auburn, R. I. (See page 115.)

Standard Roller Bearing Co., Philadelphia, Pa. "S R B." (See page 113.)

Strom—See U. S. Ball Bearing Mfg. Co.

U. S. Ball Bearing Mfg. Co., Chicago, Ill. "Strom." (See pages 91 to 94 and Front Cover.)

BEARINGS, BRONZE—See Metals, Bearing

BEARINGS, DIE CAST—See Castings, Die

BEARINGS, Drive Gear Ball Thrust, for Fords

(Ball thrust bearings to be installed at left side of differential in place of thrust washers)

Bailey Co., Geo. D., 4500 Ravenswood Ave., Chicago, Ill.

Graham Roller Bearing Co., Coudersport, Pa.

Holmes, George L., 1733 Broadway, New York, N. Y. (Eastern Distributor for Graham Bearings.) (See page 383.)

BEARINGS Drive Shaft Steady

Carter Carburetor Co., 2838-40 N. Spring Ave., St. Louis, Mo.

BEARINGS, Front Wheel, for Fords

(Special Ball and Roller Bearings for replacing Front Wheel Bearings)

National Bearings Service Co., Girard Ave & Broad St., Philadelphia, Pa. "Wright." (See page 89.)

New York Bearings Co., 311 W. 59th St., New York, N. Y. (See page 127.)

Pruyn Ball Bearing Works, 4408-10 Paul St., Philadelphia, Pa. (See page 117.)

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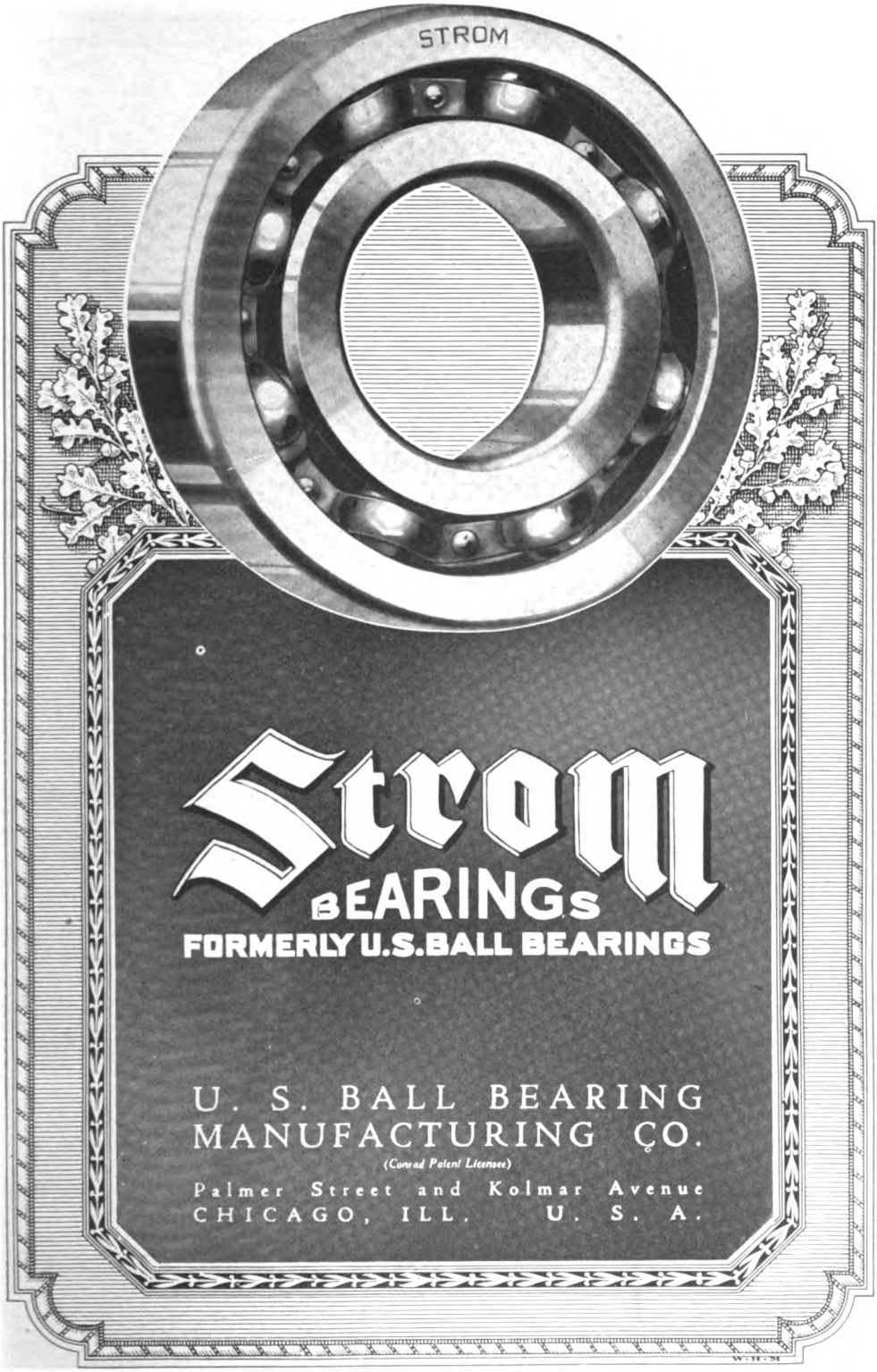

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ANNUI AR BEARINGS—LIGHT 200 SERIES

No. of Bearing	List Prices	Bore		Diameter		Width	
		Mm.	Inches	Mm.	Inches	Mm.	Inches
200	$3.60	10	0.3937	30	1.1811	9	0.3543
201	3.75	12	0.4724	32	1.2598	10	0.3937
202	4.00	15	0.5906	35	1.3780	11	0.4331
203	4.50	17	0.6693	40	1.5748	12	0.4724
204	5.40	20	0.7874	47	1.8504	14	0.5512
205	6.50	25	0.9843	52	2.0473	15	0.5906
206	7.75	30	1.1811	62	2.4410	16	0.6299
207	9.50	35	1.3780	72	2.8347	17	0.6693
208	11.25	40	1.5748	80	3.1496	18	0.7087
209	12.25	45	1.7717	85	3.3465	19	0.7480
210	14.00	50	1.9685	90	3.5433	20	0.7874
211	6.00	55	2.1654	100	3.9370	21	0.8268
212	19.50	60	2.3622	110	4.3307	22	0.8661
213	25.00	65	2.5591	120	4.7244	23	0.9055
214	27.00	70	2.7559	125	4.9213	24	0.9449
215	30.00	75	2.9528	130	5.1181	25	0.9843
216	34.00	80	3.1496	140	5.5118	26	1.0236
217	39.00	85	3.3465	150	5.9055	28	1.1024
218	48.00	90	3.5433	160	6.2992	30	1.1811
219	55.00	95	3.7402	170	6.6929	32	1.2598
220	62.00	100	3.9370	180	7.0866	34	1.3386
221	72.00	105	4.1339	190	7.4804	36	1.4173
222	82.00	110	4.3307	200	7.8741	38	1.4961

ANNULAR BEARINGS—MEDIUM 300 SERIES

No. of Bearing	List Prices	Bore		Diameter		Width	
		Mm.	Inches	Mm.	Inches	Mm.	Inches
300	$4.50	10	0.3937	35	1.3780	11	0.4331
301	4.75	12	0.4724	37	1.4567	12	0.4724
302	5.25	15	0.5906	42	1.6536	13	0.5118
303	6.00	17	0.6693	47	1.8504	14	0.5512
304	7.00	20	0.7874	52	2.0473	15	0.5906
305	8.25	25	0.9843	62	2.4410	17	0.6693
306	10.50	30	1.1811	72	2.8347	19	0.7480
307	12.50	35	1.3780	80	3.1496	21	0.8268
308	15.00	40	1.5748	90	3.5433	23	0.9055
309	18.00	45	1.7717	100	3.9370	25	0.9843
310	21.50	50	1.9685	110	4.3307	27	1.0630
311	26.00	55	2.1654	120	4.7244	29	1.1417
312	32.00	60	2.3622	130	5.1181	31	1.2205
313	39.00	65	2.5591	140	5.5118	33	1.2992
314	46.00	70	2.7559	150	5.9055	35	1.3780
315	54.00	75	2.9528	160	6.2992	37	1.4567
316	65.00	80	3.1496	170	6.6929	39	1.5354
317	78.00	85	3.3465	180	7.0866	41	1.6142
318	92.00	90	3.5433	190	7.4804	43	1.6929
319	105.00	95	3.7402	200	7.8741	45	1.7717
320	120.00	100	3.9370	215	8.4646	47	1.8504
321	135.00	105	4.1339	225	8.8583	49	1.9291
322	160.00	110	4.3307	240	9.4489	50	1.9685

ANNULAR BEARINGS—HEAVY 400 SERIES

No. of Bearing	List Prices	Bore		Diameter		Width	
		Mm.	Inches	Mm.	Inches	Mm.	Inches
403	$10.00	17	0.6693	62	2.4410	17	0.6693
404	11.50	20	0.7874	72	2.8347	19	0.7480
405	13.00	25	0.9843	80	3.1496	21	0.8268
406	16.00	30	1.1811	90	3.5433	23	0.9055
407	19.00	35	1.3780	100	3.9370	25	0.9843
408	22.00	40	1.5748	110	4.3307	27	1.0630
409	27.00	45	1.7717	120	4.7244	29	1.1417
410	33.00	50	1.9685	130	5.1181	31	1.2205
411	39.00	55	2.1654	140	5.5118	33	1.2992
412	47.00	60	2.3622	150	5.9055	35	1.3780
413	60.00	65	2.5591	160	6.2992	37	1.4567
414	80.00	70	2.7559	180	7.0866	42	1.6536
415	95.00	75	2.9528	190	7.4804	45	1.7717
416	110.00	80	3.1496	200	7.8741	48	1.8898
417	130.00	85	3.3465	210	8.2678	52	2.0473
418	150.00	90	3.5433	225	8.8583	54	2.1260
419	200.00	95	3.7402	250	9.8426	55	2.1654
420	250.00	100	3.9370	265	10.4331	60	2.3622
421	300.00	105	4.1339	290	11.4174	65	2.5591
422	380.00	110	4.3307	320	12.5985	70	2.7559

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THRUST BEARINGS—B SERIES

Number of Bearing	Price	Bore, Inches	Diameter, Inches	Thickness, Inches
1 B	$5.80	1/2	1 5/16	1/4
2 B	5.95	5/8	1 13/16	5/16
3 B	6.50	3/4	1 13/16	5/16
4 B	7.15	7/8	1 13/16	5/16
5 B	7.50	1	1 13/16	5/16
6 B	8.05	1 1/8	1 13/16	5/16
7 B	9.10	1 1/4	2 1/2	3/8
8 B	9.75	1 3/8	2 11/16	3/8
9 B	10.65	1 1/2	2 13/16	3/8
10 B	11.70	1 5/8	2 13/16	3/8
11 B	12.90	1 3/4	2 13/16	3/8
12 B	13.60	1 7/8	2 13/16	3/8
13 B	15.85	2	2 13/16	3/8
14 B	18.45	2 1/4	3 1/16	3/8
15 B	22.45	2 1/2	3 11/16	1
16 B	23.60	2 3/4	4	1
17 B	30.70	3	4 1/16	1 1/8
18 B	35.55	3 1/2	5	1 1/4
19 B	44.00	4	5 1/2	1 3/8

THRUST BEARINGS—1100 F SERIES

Number of Bearing	Price	Bore		Diameter		Thickness	
		Mm.	Inches	Mm.	Inches	Mm.	Inches
1102 F	$6.15	10	.3937	30	1.18	12	.47
1103 F	6.60	15	.5906	35	1.38	14	.55
1104 F	7.50	20	.7874	42	1.65	14	.55
1105 F	8.20	25	.9843	47	1.85	14	.55
1106 F	8.85	30	1.1811	53	2.09	15	.59
1107 F	10.45	35	1.3780	62	2.44	18	.71
1108 F	11.10	40	1.5748	64	2.52	18	.71
1109 F	13.15	45	1.7717	73	2.87	20	.79
1110 F	15.85	50	1.9685	78	3.07	20	.79
1111 F	18.10	55	2.1654	88	3.46	24	.94
1112 F	18.65	60	2.3622	90	3.54	24	.94
1113 F	24.15	65	2.5591	100	3.94	27	1.06
1114 F	25.05	70	2.7559	103	4.06	27	1.06
1115 F	26.30	75	2.9528	110	4.33	27	1.06
1116 F	30.15	80	3.1496	115	4.53	31	1.22
1117 F	33.30	85	3.3465	125	4.92	34	1.34
1118 F	36.00	90	3.5433	135	5.31	36	1.42
1119 F	41.40	95	3.7402	140	5.51	38	1.50
1120 F	44.10	100	3.9370	150	5.91	38	1.50
1121 F	48.50	105	4.1339	155	6.10	40	1.57

THRUST BEARINGS—1100 AND 1100 U SERIES

Number of Bearing	Price		Bore		Diameter		Thickness	
	Without Washer	With Washer	Mm.	Inches	Mm.	Inches	Mm.	Inches
1102	$6.50	$7.75	10	0.3937	30	1.18	14	0.55
1103	7.05	8.50	15	0.5906	35	1.38	15	0.59
1104	7.85	9.65	20	0.7874	42	1.65	16	0.63
1105	8.55	10.45	25	0.9843	47	1.85	17	0.67
1106	9.40	11.60	30	1.1811	53	2.09	18	0 71
1107	11.00	13.40	35	1.3780	62	2.44	21	0.83
1108	12.15	14.75	40	1.5748	64	2.52	21	0.83
1109	14.05	17.25	45	1.7717	73	2.87	25	0.98
1110	18.30	22.70	50	1.9685	78	3.07	25	0.98
1111	21 45	26.70	55	2.1654	88	3.46	28	1.10
1112	24.25	29.90	60	2.3622	90	3.54	28	1.10
1113	27.10	33.40	65	2.5591	100	3.94	32	1.26
1114	29.35	35.40	70	2.7559	103	4.06	32	1.26
1115	31.70	39.00	75	2.9528	110	4.33	32	1.26
1116	35.50	44.20	80	3.1496	115	4.53	35	1.38
1117	38.90	49.75	85	3.3465	125	4.92	38	1.50
1118	43.30	54.25	90	3.5433	135	5.32	38	1.50
1119	48.75	60.50	95	3.7402	140	5.51	41	1.61
1120	53.35	66.50	100	3.9370	150	5.91	41	1.61
1121	58.45	75.75	105	4.1339	155	6.10	46	1.81

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The information and bearing sizes given herewith, obviously, are extremely limited. We have endeavored only to show the principal dimensions covering those radial and thrust bearings most frequently used in the automobile industry.

As a matter of fact the output of Strom Bearings is probably the most complete as well as the most diversified of any bearing manufacturer in the world. Not only do we manufacture a complete range of radial standard millimeter sizes but, in addition to this, we produce a large majority of the radial inch sizes used abroad in addition to a practically complete series of aircraft bearings covering almost every type and size of airplane in use at the present time.

The following is a list of the different types of Strom Bearings manufactured:

Radial.
Angular Contact (Combination Radial and Thrust).
Plain Thrust (In Metric and Inch Dimensions).
Grooved Thrust (In Metric and Inch Dimensions).
Grooved Thrust (With and Without Aligning Washers).
Double Direction Thrust (With and Without Aligning Washers).

Attention is directed particularly to the fact that our production of thrust bearings is so complete that we are able to interchange as standard with most of the many thrust bearing lists.

Emphasis is placed upon the fact that the entire output of this big, thoroughly modern factory, shown below, consists only of the highest quality chrome steel bearings possible of manufacture.

Write for complete catalog, engineering literature and prices. We maintain a large staff of designing engineers that are at the disposal of our customers for the solution of any ball bearing problem.

U. S. BALL BEARING MFG. CO.

(Conrad Patent Licensee)

CHICAGO ILL., U. S. A.

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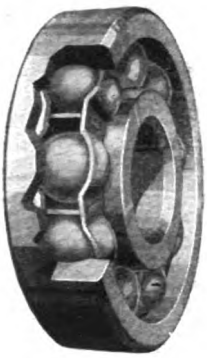
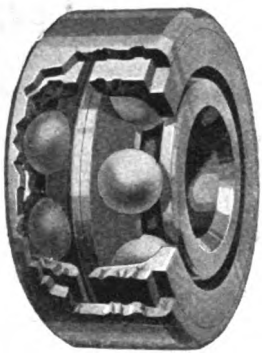
New Departure Ball Bearings



Single Row



Double Row

Radax

Practically "overnight" service is obtainable by ordering your bearings for repair and replacement work direct from these distributors. New Departure Single Row Ball Bearings are internationally standardized.

DISTRIBUTORS

Albany	Albany Hdw. & Iron Co.	
Atlanta	Bearings Service Co.	215 Peachtree St.
	Elyea-Austell Co.	
Boston	Bearings Service Co.	835 Beacon St.
Cincinnati	Herman Bumiller Co.	432 Main St.
Chicago	Bearings Service Co.	2715-17 So. Michigan Ave.
Cleveland	Bearings Service Co.	4213 Euclid Ave.
Dallas, Texas	Bearings Service Co.	2034 Main St.
	Hans Johnsen	1419 Commerce St.
Denver	Bearings Service Co.	1637 Court Place
	M. L. Foss	1729 California St.
Detroit	Bearings Service Co.	733 Cass Ave.
Indianapolis, Ind.	Bearings Service Co.	521 No. Meridian St.
	H. T. Hearsey Co.	339 N. Capitol Ave.
Kansas City, Mo.	Bearings Service Co.	2205 Grand Ave.
Los Angeles	Bearings Service Co.	Cor. 12th St. and Grand Ave.
Minneapolis	Bearings Service Co.	1628 Harmon Place
New Orleans	Bearings Service Co.	609 Baronne St.
New York City	Bearings Service Co.	239 W. 56th St.
Omaha	Bearings Service Co.	1812 Harney St.
Philadelphia	Bearings Service Co.	721 Broad St.
Pittsburgh	Bearings Service Co.	130 North Highland Ave.
Portland, Me.	James Bailey Co.	18 Free St.
Portland, Ore.	Bearings Service Co.	24 North Broadway
Rochester	Bearings Service Co.	156 East Avenue
Sacramento	Kimball-Upson Co.	609-11 K St. and 608-10 Oak Ave.
Saint Louis	Bearings Service Co.	3300 Locust St.
San Francisco	Bearings Service Co.	Van Ness and Clay Sts.
Seattle	Bearings Service Co.	Cor. Pine St. and Bellevue
Toronto	Bearings Service Co.	838 Younge St.
San Juan, P. R.	Pietrantoni & Sojo	

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Executive Offices: Bristol, Conn. **Western Branch: Detroit, Mich.**

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BEARINGS, Front Wheel, for Fords (Continued)

Roll-Rite Mfg. Co., 4 Broad St., Charleston, S. C.

Standard Roller Bearing Co., Philadelphia, Pa. "Standford." (See page 113.)

Standford—See Standard Roller Bearing Co.

Wright—See National Bearings Service Co.

BEARINGS, Motor Boat Stern

Eisenbrandt, F. B., Light St., Baltimore, Md.

Monarch Valve Co., 112 Front St., Brooklyn, N. Y.

BEARINGS, Oilless

(Impregnated Wood or Graphite Bronze Bearings or Bushings)

Arguto Oilless Bearing Co., 149 W. Berkeley St., Philadelphia, Pa.

Bound Brook Oil-less Bearing Co., Bound Brook, N. J. "Nigrum."

Nigrum—See Bound Brook Oil-less Bearing Co.

Nolu Oilless Bearing Co., 6 E. Johnson St., Philadelphia, Pa.

BEARINGS, Propeller Shaft, Steady—See Bearings, Drive Shaft Steady

BEARINGS, Reground Ball

Ahlberg Bearing Co., 2634 Michigan Ave., Chicago, Ill.

Bearings Co. of Pennsylvania, 684 N. Broad St., Philadelphia, Pa.

Bearings Shop, 1402 Michigan Ave., Chicago, Ill.

New York Bearings Co., 311 W. 59th St., New York, N. Y. (See page 127.)

Pacific Ball Bearing Co., 1406 W. Pico St., Los Angeles, Cal.

Pruyn Ball Bearing Works, 4408-10 Paul St., Philadelphia, Pa. (See page 117.)

S. B. R. Specialty Co., 17-19 Princeton St., East Orange, N. J.

Sherwood, A. S., 258 W. 54th St., New York, N. Y.

Smith Bearing & Mfg. Co., 1970 E. 66th St., Cleveland, O.

Wallace Supplies Mfg. Co., 420 Orleans St., Chicago, Ill.

BEARINGS, Roller

Ball & Roller Bearing Co., 22 Maple Ave., Danbury, Conn.

Bock—See Standard Parts Co.

Bower Roller Bearing Co., Detroit, Mich. (See page 119.)

Graham Roller Bearing Co., Coudersport, Pa.

Gwilliam Co., 253 W. 58th St., New York, N. Y. (Metropolitan Distributors for S R B Roller Bearings.) (See page 89.)

Hyatt Roller Bearing Co., Detroit, Mich. (See page 867.)

Makutchan Roller Bearing Co., 322 S. Michigan Ave., Chicago, Ill.

National Bearings Service Co., Girard Ave. & Broad St., Philadelphia, Pa. (Sole Distributors for Wright Roller Bearing Co., Philadelphia, Pa.) (See page 89.)

New York Bearings Co., 311 W. 59th St., New York, N. Y. (Dealers.) (See page 127.)

Norma Co. of America, 1790 Broadway, New York, N. Y. (See page 68.)

Ohio Metal Products Co., 35-39 Edgar St., Dayton, O.

Regina Co., Rahway, N. J.

S R B—See Standard Roller Bearing Co.

Standard Machinery Co., Auburn, R. I. (See page 115.)

Standard Parts Co., Cleveland, O. "Bock." (See pages 408 and 409.)

Standard Roller Bearing Co., Philadelphia, Pa. "S R B." (See page 113.)

Timken Roller Bearing Co., Duber Ave. & 19th St., Canton, O.

Wright Roller Bearing Co.—See National Bearings Service Co.

BEARINGS, STERN—See Bearings, Motor Boat Stern

BEARINGS, THRUST—See Bearings, Ball; also Bearings, Roller

BEDS or BERTHS, Car and Camp

(Special Beds or Berths for use either in the car or under tent when touring)

Auto Bed Camp Mfg. Co., 1504 Grand Ave., Kansas City, Mo.

Any-Kar—See Peoria Auto-Kot Co.

Auto Device Mfg. Co., Dalhart, Tex. "Tandy's."

Burch Mfg. Co., F. J., Pueblo, Colo. "Pullman."

Enterprise Bed Co., Hammond, Ind.

Handy Camp—See Tourist Auto Equipment Co.

Moore, Leslie E., 1042 S. Olive St., Los Angeles, Cal.

Musso, F. G., San Jose, Cal.

Peoria Auto-Kot Co., 115 N. Madison St., Peoria, Ill. "Any-Kar."

Perfection—See Pneumatic Mfg. Co.

Pneumatic Mfg. Co., 526 17th St., Brooklyn, N. Y. "Perfection."

Pullman—See Burch Mfg. Co.

Restgood—See Wilson & Co.

Schilling Co., L. F., Salem, O.

Stoll Mfg. Co., 33d & Walnut Sts., Denver, Colo.

Tandy's—See Auto Device Mfg. Co.

Tourist Auto Equipment Co., Dahlgren, Ill. "Handy Camp."

Way Sagless Spring Co., E. Hennepin St. & Fifth Ave., S. E., Minneapolis, Minn.

Wilson & Co., Thos., 43rd St. & Ashland Ave., Chicago, Ill. "Restgood."

Wolfe & Co., 417 Pontius Ave., Seattle, Wash.

BEDS or BERTHS, Car and Camp, for Fords

(Special beds or berths for use either in the car or under tent when touring)

Auto Bed Co., Bellingham, Wash. "McMillin."

Booth & Co., Sheldon, 1505 E. 53d St., Chicago, Ill.

Field Mfg. Co., Owosso, Mich.

McMillin—See Auto Bed Co.

Ray Automobile Co., 1301-05 Commerce St., Fort Worth, Tex.

Schilling Co., L. F., Salem, O.

Way Sagless Spring Co., E. Hennepin St. & Fifth Ave., S. E., Minneapolis, Minn.

Wolfe & Co., 418 Pontius Ave., Seattle, Wash.

BELL RINGERS—See Pushes, Foot

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Self Aligning.

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SKF BALL BEARING CO.

Hartford, —352— Conn.

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BELLS, Electric

(For use as a warning signal in place of horn)

Cathedral Bell Mfg. Co., Cathedral & Chase Sts., Baltimore, Md.
Delta-Star Electric Co., 617-31 W. Jackson Blvd., Chicago, Ill.
Liberty Bell Co., The Arcade, Cleveland, O.
Rousseau, David, Ossining, N. Y.
Trinity Bell Electrical Mfg. Co., 306 W. Kinzie St., Chicago, Ill.

BELLS, Electric, for Fords

(For use as a warning signal in place of horn)

Liberty Bell Co., The Arcade, Cleveland, O.

BELLS or GONGS, Mechanical

(For use as a warning signal in place of horn)

Bevin Bros. Mfg. Co., East Hampton, Conn.
East Hampton Bell Co., East Hampton, Conn.
Mossberg Co., Frank, Attleboro, Mass. (See page 769.)
New Departure Mfg. Co., Bristol, Conn. (See page 95.)

BELT ADJUSTERS FOR FORDS—See Adjusters, Fan Belt

BELT CONNECTORS—See Fasteners, Belt

BELT COUPLINGS—See Fasteners, Belt

BELT DRESSING—See Dressing, Clutch

BELT FASTENERS—See Fasteners, Belt

BELT GUIDES FOR FORDS—See Guides, Fan Belt

BELTING, Leather

(Flat and Round Belting for Fan Belts; for Endless Fabric Belts—See Belts, Endless Fabric; for V-Belts—See Belts, V; for Spiral Wire Belts—See Belts, Spiral Wire)

Adheso—See Hide, Leather & Belting Co.
American Belting & Tanning Co., 135 Oliver St., Boston, Mass.
Auto Leather Mfg. Co., 35 Warren St., New York, N. Y. "Kaenjay." (See page 133.)
Bonner & Barnewell, 30 Church St., New York, N. Y.
Bradford Belting Co., 201 Walnut St., Cincinnati, O. "Monarch."
Chibeco—See Chicago Belting Co.
Chicago Belting Co., 113-25 N. Green St., Chicago, Ill. "Chibeco."
Cino—See Mooney Belting Co.
Cocheco—See Williams & Sons.
Comber—See Rahmann & Co.
Duxbak—See Schieren Co.
Endurmo—See Missouri Belting Co.
G. & K.—See Graton & Knight Mfg. Co.
Graton & Knight Mfg. Co., Worcester, Mass. "G. & K." (See page 99.)
Hide, Leather & Belting Co., 215 S. Meridian St., Indianapolis, Ind. "Adheso," "Wetprufe," "Leatheround."
(See page 389.)
Houghton & Co., E. F., 240 W. Somerset St., Philadelphia, Pa. "Vim."
Hudson Belting Co., 1-3 Eaton Pl., Worcester, Mass.
Jewell Belting Co., 55 Trumbull St., Hartford, Conn.
Johnson & Co., W. L., 134 Washington Ave., Endicott, N. Y. "Tuffide."
Kaenjay—See Auto Leather Mfg. Co.
Leatheround—See Hide, Leather & Belting Co.
Missouri Belting Co., Grand Ave. & La Salle St., St. Louis, Mo. "Endurmo."
Monarch—See Bradford Belting Co.
Mooney Belting Co., 844 W. Sixth St., Cincinnati, O. "Cino."
National Leather Belting Co., 342 E. 38th St., New York, N. Y.
National Leather Mfg. Co., Niles, Mich.
Norwich Belt Mfg. Co., Norwich, Conn.
Page Belting Co., Concord, N. H.
Rahmann & Co., Geo., 31 Spruce St., New York, N. Y. "Comber."
Rhoads & Sons, J. E., 12 N. Third St., Philadelphia, Pa. "Tannate."
Schieren Co., Chas. A., 76 Ferry St., New York, N. Y. "Duxbak."
Tannate—See Rhoads & Sons.
Taylor Belting Co., 247 S. Meridian St., Indianapolis, Ind.
Tuffide—See Johnson & Co.
Vim—See Houghton & Co.
Weatherhead-Thompson Co., Pawtucket, R. I.
Wetprufe—See Hide, Leather & Belting Co.
Williams & Sons, I. B., 9 Orchard St., Dover, N. H. "Cocheco."

BELTS, COTTON—See Belts, Endless Fabric

BELTS, ENDLESS FABRIC FOR FORDS—See Belts, Fan

BELTS, Endless Fabric

(For Leather Belts—See Belting, Leather; also Belts, V; for Wire Belts—See Belts, Spiral Wire)

A-B-C—See American Brake-Lining Co.
Advance Automobile Accessories Corp., Dept. K10-1, 56 E. Randolph St., Chicago, Ill. (See page 423.)
Advance Packing & Supply Co., 11 N. Franklin St., Chicago, Ill. "Vulcan."
American Brake-Lining Co., Lansdale, Pa. "A-B-C." (See page 415.)
Bond Co., Charles, 520 Arch St., Philadelphia, Pa. "Fabritex."
Brophy Belting & Supply Co., Madison, Ind.
Buettner Co., Charles H., Cincinnati, O.
Colorado Tire & Leather Co., Denver, Colo. "Gates Vulco-Cord."
Curry Co., J. W., 2615 Cummins St., Cincinnati, O.
Empire Weaving & Belting Corp. (East Rochester), Rochester, N. Y.
Fabritex—See Bond Co.
Gates Vulco-Cord—See Colorado Tire & Leather Co.
Geisel, Otto E., 3202-06 Oxford St., Philadelphia, Pa. (See page 101.)
Gilmer Co., L. H., Philadelphia, Pa. (See page 103.)
Lakewood Fabric Belting & Mfg. Co., 1518 Highland Ave., Lakewood, O.
Lambert Multiplus Co., 125 Grand Ave., Portland, Ore. "Trubipruf."
Main Belting Co., 1219 Carpenter St., Philadelphia, Pa.
Modern Belt & Web Co., Emerson Tower Bldg., Baltimore, Md.
Rusco—See Russell Mfg. Co.
Russell Mfg. Co., Middletown, Conn. "Rusco." (See page 415.)

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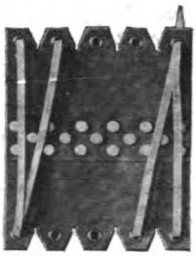
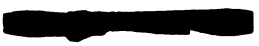

Studded Tire Sleeve


Tire Strap

Crank Holder
(open ends)

Fan Belt

Hood Strap

Top Strap

FIVE REASONS WHY

Graton & Knight Auto Leathers are better:

1. Graton & Knight Auto Leathers are the result of sixty-eight years' experience in tanning leather and manufacturing it into high grade belting and specialties.

2. They are absolutely uniform, a vital factor.

3. They are manufactured in a plant with unsurpassed facilities for making every variety of leather strapping and sundries.

4. They can be produced in any quantity and at short notice—always uniform.

5. Graton & Knight Auto Leathers always will be good products, honestly made and honestly sold, otherwise they cannot bear the Graton & Knight Trade Mark.

Send samples or blue prints for our best price. Catalog upon request.

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Oak Leather Tanners and Belt Makers

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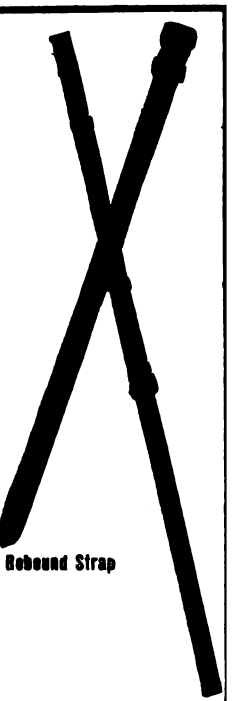
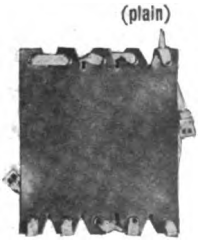
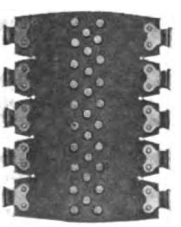

Rebound Strap

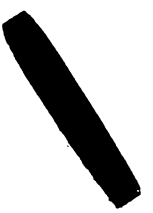
Tailboard Strap

Clincher Tire Sleeve
(plain)


Plain Tire Sleeve

Crank Holder
(closed end)


Clincher Tire Sleeve
(studded)


Fan Belt
(stitched)

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BELTS, Endless Fabric (Continued)

Smith Belting Co., Manning J., 39 E. Ashmead St. (Germantown), Philadelphia, Pa. (See page 101.)

Standard Woven Fabric Co., Walpole, Mass. (See page 78.)

Trubipruf—See Lambert Multiplus Co.

Vulcan—See Advance Packing & Supply Co.

BELTS, Fan, for Fords

(Adjustable and endless belts of Leather, Rawhide and Woven Fabric)

Advance Automobile Accessories Corp., Dept. K10-1, 56 E. Randolph St., Chicago, Ill. (See page 423.)

Apco Mfg. Co., Eddy St., Providence, R. I.

Auto Equipment Co. (Roxborough), Philadelphia, Pa. "Perfection."

Auto Leather Mfg. Co., 35 Warren St., New York, N. Y. "Keanjay." (See page 133.)

Badger Handle Co., Kuppmeier Bldg., Milwaukee, Wis.

Beaver—See Mechanical Rubber Co.

Bond Co., Charles, 520 Arch St., Philadelphia, Pa. "Sterling."

Buettner Co, Charles H., Cincinnati, O. "Unisco."

Central Brass & Fixture Co., Dept. A, Springfield, O. (See page 137.)

Chibeco—See Chicago Belting Co.

Chicago Belting Co., 113-25 N. Green St., Chicago, Ill. "Chibeco."

Chicago Rawhide Mfg. Co.—See Zinke Co.

Chicago Wholesale Saddlery & Mfg. Co., 125-27 N. Halsted St., Chicago, Ill.

Colorado Tire & Leather Co., Denver, Colo. "Gates Vulco-Cord."

Crowe—See Mechanical Belt Co.

Curry Co., J. W., 2615 Cummins St., Cincinnati, O.

E G Mfg. Co., 250 W. 54th St., New York, N. Y. (Dealers.) (See page 215.)

E-Z-Put-On—See Paulus, Alfred H.

Ettinger Mfg. Co., 49-51 Clymer St., Brooklyn, N. Y. (See page 101.)

Evergood—See Grossman Mfg. Corp.

Federal Asbestos Co., Van Houton St., Paterson, N. J. "Fordbestos."

Fordbestos—See Federal Asbestos Co.

G. & K.—See Graton & Knight Mfg. Co.

Gates Vulco-Cord—See Colorado Tire & Leather Co.

Geisel, Otto E., 3202-06 Oxford St., Philadelphia, Pa. (See page 101)

General Tire & Rubber Co., E. Market St., Akron, O.

Gilmer Co., L. H., Philadelphia, Pa. (See page 103.)

Graton & Knight Mfg. Co., Worcester, Mass. "G. & K." (See page 99.)

Grossman Mfg. Corp., Emil, Bush Terminal Bldg. No. 20, Brooklyn, N. Y. "Evergood."

Hager & Son, Chas., 1926 Broadway, New York, N. Y.

Hagstrom Bros. Mfg. Co., Lindsborg, Kans.

Haney & Co., J. H., Hastings, Neb. "Rose."

Hide, Leather & Belting Co., 215 S. Meridian St., Indianapolis, Ind. "Wetprufe." (See page 389.)

Holmes, George L., 1733 Broadway, New York, N. Y. (Eastern Distributor for Crowe Belts.) (See page 383.)

Holtite Spring Belt Co., 6 Smith St., Paterson, N. J.

Hoover Co., W. H., New Berlin, O.

Howe Mfg. Co., Chicago, Ill. "Kork Tred."

Indigan—See National Leather Mfg. Co.

Invincible—See Peters & Herron Dash Co.

Kaenjay—See Auto Leather Mfg. Co.

Kork Tred—See Howe Mfg. Co.

Krome—See Zinke Co.

Lakewood Fabric Belting & Mfg. Co., 1518 Highland Ave., Lakewood, N. J.

Latigo—See Perkins-Campbell Co.

Mechanical Belt Co., 1205 Frederick Ave., St. Joseph, Mo. "Crowe." (See page 101.)

Mechanical Rubber Co., 307 W. Randolph St., Chicago, Ill. "Usco," "Beaver."

Mitchell & Smith Co., 1092 Commonwealth Ave., Boston, Mass.

Modern Belt & Web Co., Emerson Tower Bldg., Baltimore, Md.

Nathan Novelty Mfg. Co., 84-90 Reade St., New York, N. Y. "Nathigo." (See page 153.)

Nathigo—See Nathan Novelty Mfg. Co.

National Leather Mfg. Co., Niles, Mich. "Indigan."

Norwich Belt Mfg. Co., Norwich, Conn.

Nott Co., W. S., Minneapolis, Minn.

Paragon—See Queen City Mfg. Co.

Paulus, Alfred H., 2507-11 Potter St., Philadelphia, Pa. "E-Z-Put-On."

Perfection—See Auto Equipment Co.

Perkins-Campbell Co., 634 Broadway, Cincinnati, O. "Latigo." (See page 227.)

Peters & Herron Dash Co., Gift St., Columbus, O. "Invincible."

Powers Mfg. Co., 1340 Sycamore St., Waterloo, Ia.

Queen City Mfg. Co. (Brighton Sta.), Cincinnati, O. "Paragon."

Rhoads & Sons, J. E., 12 N. Third St., Philadelphia, Pa.

Rose—See Haney & Co.

Rugg & Co., E. L., Newark, O.

Rusco—See Russell Mfg. Co.

Russell Mfg. Co., Middletown, Conn. "Rusco." (See page 415.)

Self Adjusting Belt Co., Watertown, S. Dak.

Standard Woven Fabric Co., Walpole, Mass. (See page 787.)

Stephens Rubber Co., A. J., Kansas City, Mo.

Sterling—See Bond Co.

Thermoid Rubber Co., Trenton, N. J.

Unisco—See Buettner Co.

Usco—See Mechanical Rubber Co.

Voorhees Rubber Mfg. Co., 13-46 Bostwick Ave., Jersey City, N. J.

Wakefield Sales Co., Trempealeau, Wis.

Wetprufe—See Hide, Leather & Belting Co.

Whitehouse-LeCompte Mfg. Co., 42-54 Elm St., Newark, N. J.

Woodworth Mfg. Corp., Niagara Falls, N. Y. (See page 721.)

Zinke Co., 1323-25 Michigan Ave., Chicago, Ill. (Sole Distributors for Chicago Rawhide Mfg. Co., Chicago, Ill.) "Krome."

BELTS, ROBE—See Straps, Robe

BELTS, Spiral Wire

(For Leather Belts—See Belting, Leather; also Belts, V; for Fabric Belts—See Belts, Endless Fabric)

Bull Dog—See N. Y. Wire & Spring Co.

Calcutts—See Gardner Wire Co.

Eureka Spring Co., 347 W. Broadway, New York, N. Y.

Gardner Wire Co., 5648 Race Ave., Chicago, Ill. "Calcutts."

Hebb, Geo. A., 70 William St., Newark, N. J.

Kelley, A. F., 178 S. Main St., Providence, R. I. "Kello."

Kello—See Kelley, A. F.

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Fan Belts both Woven Endless and Stitched

Axle Straps
Webbing, Plain and Waterproofed
Brake and Transmission Lining

Quantity production enables us to give interesting prices and yet each unit of our production is made as carefully as if our reputation depended upon it individually.

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Motor Overheating

Do you carry Crowe Mechanical Fan Belts in your line of Auto accessories? "Crowe Belts" create big profits and satisfied customers. Hundreds of dealers, all over the country are making big money selling the

CROWE
Mechanical Fan BELT

It is a steel chain belt with leather friction surface. Will not stretch or break. Instantly adjustable. Runs on same pulleys as old belt.

Crowe belts are adapted for use on any cars, trucks, or tractors having either flat or "V" shaped pulleys measuring from 11/16" to 1½" wide.

15,000 MILE GUARANTEE

Belts for Fords and other passenger cars are guaranteed for 15,000 miles. Proportionate guarantee for trucks, tractors and tractor attachments.

Dealers—Write your jobber or direct for prices and full details. Don't delay. The field is unlimited. Write

MECHANICAL BELT COMPANY
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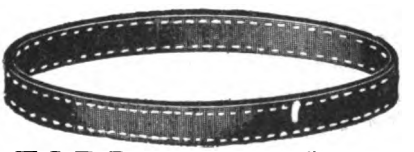
No. 102

We Specialize In



No. 103

FAN BELTS FOR FORD CARS

HERE ARE FOUR OF OUR LEADERS—WRITE FOR SAMPLES AND PRICES.

No. 101

ETTINGER MFG. CO., Inc.
49-61 Clymer Street
Brooklyn, N. Y.

No. 100

GEISEL'S "PERFECTION" ENDLESS WEB BELT

It Grips Like a Bulldog

The Perfection Endless web belt never relaxes its hold. That means 20% increased power over ordinary belting.

There is no doubling of bulk, no lapping of ends, no braid or binding to fray out and weaken the hold. It is noiseless—weatherproof.

Wherever flat belts are used the Perfection Belt will give added efficiency.

Write for samples.

OTTO E. GEISEL, 3202-4-6 Oxford St., Philadelphia, Pa.

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BELTS, Spiral Wire (Continued)

Morgan Spring Co., W. Boylston St., Worcester, Mass.

New York Wire & Spring Co., 586-88 Washington St., New York, N. Y. "Bull Dog." (See page 641.)

Self Adjusting Belt Co., 420 First Ave., N. E., Watertown, S. Dak.

Webb Mfg. Co., ft. Center St., Newark, N. J. (See page 715.)

Wilson, Robert P., 20 Clinton St., Newark, N. J.

BELTS, V

(For Flat or Round Leather Belts—See Belting, Leather; for Fabric Belts—See Belts, Endless Fabric; for Wire Belts—See Belts, Spiral Wire)

Adheso—See Hide, Leather & Belting Co.

Advance Automobile Accessories Corp., Dept. K10-1, 56 E. Randolph St., Chicago, Ill. (See page 423.)

Algco—See Auburn Leather Goods Co.

Auburn Leather Goods Co., 3 Miller St., Auburn, N. Y. "Algco."

Auto Leather Mfg. Co., 35 Warren St., New York, N. Y. "Kaenjay." (See page 133.)

Badger Handle Co., Kuppmeier Bldg., Milwaukee, Wis.

Buettner Co., Charles H., Cincinnati, O. "Unisco."

Chibeco—See Chicago Belting Co.

Chicago Belting Co., 113-25 N. Green St., Chicago, Ill. "Chibeco."

Chicago Rawhide Mfg. Co., 1301 Elston Ave., Chicago, Ill.

Coe & Brown, 202-04 George St., New Haven, Conn.

Craig Mfg. Co., 302 N. 16th St., Cedar Rapids, Ia.

Crowe—See Mechanical Belt Co.

Detroit Leather Works, Detroit Mich. "Flexo." (See page 129.)

Duckwall Belting & Hose Co., 201-05 N. West St., Indianapolis, Ind. (See page 469.)

Flexo—See Detroit Leather Works.

Graton & Knight Mfg. Co., Worcester, Mass. "Spartan." (See page 99.)

Hide, Leather & Belting Co., 215 S. Meridian St., Indianapolis, Ind. "Wetprufe," "Adheso," "Vee Sol," "Vee Flex." (See page 389.)

Holmes, George L., 1733 Broadway, New York, N. Y. (Eastern Distributor for "Crowe" Belts.) (See page 383.)

Hoover Co., W. H., New Berlin, O.

Kaenjay—See Auto Leather Mfg. Co.

Kontak—See Rahmann & Co.

Mechanical Belt Co., 1205 Frederick Ave., St. Joseph, Mo. "Crowe." (See page 101.)

Mesinger Mfg. Co., H. & F., Austin Pl. & E. 144th St., New York, N. Y.

National Leather Belting Co., 342 E. 38th St., New York, N. Y.

National Leather Mfg. Co., Niles, Mich.

Page Belting Co., Concord, N. H.

Rahmann & Co., Geo., 31 Spruce St., New York, N. Y. "Kontak."

Rhoads & Sons, J. E., 12 N. Third St., Philadelphia, Pa.

Schieren Co., Chas. A., 76 Ferry St., New York, N. Y.

Spartan—See Graton & Knight Mfg. Co.

Sutherland Co., F. L., 139 Beaubien St., Detroit, Mich. (See page 523.)

Unisco—See Buettner Co.

Vee Flex—See Hide, Leather & Belting Co.

Vee Sol—See Hide, Leather & Belting Co.

Wakefield Sales Co., Trempealeau, Wis.

Wetprufe—See Hide, Leather & Belting Co.

BENCH LATHES—See Lathes, Bench

BENCH VISES—See Vises, Machinists

BENDERS, Angle

(Hand Power)

Bertsch & Co., Cambridge City, Ind.

Excelsior Tool & Machine Co., 31st St. & Ridge Ave., East St. Louis, Ill. "X L C R."

Hinman & Co., D. A., Sandwich, Ill.

Wallace Supplies Mfg. Co., 420 Orleans St., Chicago, Ill.

X L C R—See Excelsior Tool & Machine Co

BENDING MACHINES—See Machines, Wood Bending

BENDINGS, Wood

(For Seat Backs; for Metal Seat Backs—See Backs, Metal Seat)

Campbell & Dann Mfg. Co., Tullahoma, Tenn.

Dann Bros. & Co., 80-88 Franklin St., New Haven, Conn.

Pfau Mfg. Co., Cincinnati, O.

Shepard & Sons, H. G., James & River Sts., New Haven, Conn.

Tucker Wood Work Co., Sidney, O.

Wheel & Wood Bending Co., 141 John St., Bridgeport, Conn.

BERTHS, CAR—See Beds or Berth, Car

BEVEL GEARS FOR FORDS—See Gears, Special Ratio

BILGE BAILERS—See Bailers, Motor Boat, Automatic; also Pumps, Motor Boat Bilge

BILGE PUMPS—See Pumps, Motor Boat Bilge

BILLIKENS, RADIATOR—See Ornaments, Radiator

BILLING SYSTEMS—See Books, Accounting

BINDING, Mat and Carpet

(Metal Binding for Carpet, Linoleum or Rubber Mats)

Douglas & Lomason Co., 642 Lincoln Ave., Detroit, Mich.

BINDINGS, Upholstery

Backstay Machine & Leather Co., Oak & Howard Sts., Union City, Ind.

Bailey Co., G. W., 127 Crescent St., Brockton, Mass.

Bauer Bros. Mfg. Co., 1035-37 Richmond St., Cincinnati, O.

Brockton Stay Co., 101 Belmont St., Brockton, Mass.

Carter Co., Geo. R., 1600-20 Kentucky Ave., Connersville, Ind.

Cincinnati Welt Co., 118 Opera Pl., Cincinnati, O.

Edwards Mfg. Co., 216-20 Monroe Ave., Detroit, Mich.

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Many Automobile Manufacturers Helped Create This Demand for You

The time has now come when there is a great demand for Gilmer Woven Endless Fan Belts and other Gilmer products by the consumer. This is the logical result of the use of Gilmer Fan Belts on more than half the automobiles in America.

The L. H. Gilmer Co. therefore announces that to meet this present and growing demand the retail trade will be supplied through recognized jobbers.

Other Gilmer products of equal merit and almost equal fame are Gilmer Woven

Rebound Straps **Radiator Lace**
Tire Straps **Body Linings**
Brake Banding Sets for Fords

These are nationally advertised and almost universally used specialties. They are put up for retail trade in attractive and convenient form. All are tough, long-fibre cotton, spun into yarn in our own mills and woven on our own looms for the specific duties for which they are designed by our engineers.

Prices and profits are right. Your jobber is or will be able to furnish you with these goods. Or write us direct, giving your jobber's name and address.

L. H. GILMER CO. **Philadelphia**

Manufacturers of Woven Endless Belts and Belting for all purposes

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BINDINGS, Upholstery (Continued)

Landers Bros. Co., Blucher & Buckingham St., Toledo, O.

Painesville Metallic Binding Co., 200 State St., Painesville, O.

Wade Mfg. Co., 52 Haverhill St., Brockton, Mass.

Woodward & Cochey, 550 Broad St., Lynn, Mass.

BINS, SHOP—See Racks, Metal Tool

BLADES, Hack Saw

(For Hack Saw Frames—See Frames, Hack Saw)

A. A. A.—See Atkins & Co.

Arrow Head—See Jennings & Co.

Atkins & Co., E. C., South & Illinois Sts., Indianapolis, Ind. "A. A. A."

Boston Saw & Tool Co., 94 Essex St., Boston, Mass. "Knoxall."

Chromol—See Disston & Sons.

Diamond Saw & Stamping Works, 357-61 Seventh St., Buffalo, N. Y. "Sterling."

Disston & Sons, Henry, (Tacony), Philadelphia, Pa. "Chromol."

Eureka—See Thompson & Son Co.

Goodell-Pratt Co., Greenfield, Mass. (See page 751.)

Griffin Co., G. W., Franklin, N. H.

Jennings & Co., C. E., 71-73 Murray St., New York, N. Y. "Arrow Head."

Knoxall—See Boston Saw & Tool Co.

Milford—See Thompson & Son Co.

Millers Falls Co., Millers Falls, Mass. "Star."

Modern Equipment Co., 27 Haymarket Sq., Boston, Mass.

Napier Saw Works, 40 Napier St., Springfield, Mass.

Racine Tool & Machine Co., 1441 Junction Ave., Racine, Wis.

Red Devil—See Smith & Hemenway.

Simonds Mfg. Co., North St., Fitchburg, Mass.

Simplex Tool & Supply Co., 127 Oliver St., Boston, Mass.

Smith & Hemenway, 130 Colt St., Irvington, N. J. "Red Devil."

Stapf & Co., John B., Dunkirk, N. Y

Star—See Millers Falls Co.

Sterling—See Diamond Saw & Stamping Works.

TT.—See Thompson & Son Co.

Thompson & Son Co., Henry G., 492 State St., New Haven, Conn. "Milford," "Eureka," "XL," "TT."

Universal—See West Haven Mfg. Co.

Utility—See West Haven Mfg. Co.

Victor Saw Works, Rowland Ave., Springfield, Mass.

West Haven Mfg. Co., 22 Elm St. (West Haven), New Haven, Conn. "Universal," "Utility."

XL—See Thompson & Son Co.

BLANKS, GEAR—See Gears, Blank

BLOCKS, CAR EXTRACTING—See Winches and Blocks

BLOCKS, CAR SHIPPING—See Chocks, Car Shipping

BLOCKS, CHAIN—See Cranes, Portable

BLOW TORCHES—See Torches, Gasoline

BLOWOUT PATCHES—See Sleeves, Tire Repair; also Shoes, Inner Tire

BOARD BRACES FOR FORDS—See Braces, Running Board

BOARDS, COWL, FOR FORDS — See Cowls, Dash

BOARDS, DASH—See Dashes, Wood

BOARDS, FLOOR—See Parts, Wood Automobile

BOARDS, Running

(Pressed or Stamped Steel, Wood and Linoleum or Rubber Covered Running Boards)

Bossert Corp., Utica, N. Y. (See page 363.)

Buffalo Pressed Steel Co., Buffalo, N. Y. (See page 473.)

Detroit Pressed Steel Co., Detroit, Mich. (See page 365.)

Erdle Perforating Co., 171 York St., Rochester, N. Y.

Forsyth Bros. Co., McCormick Bldg., Chicago, Ill.

Hydraulic Pressed Steel Co., 3180 E. 61st St., Cleveland, O. (See page 297.)

Michigan Crown Fender Co., Ypsilanti, Mich.

Michigan Stamping Co., Mack Ave. & Detroit Terminal, Detroit, Mich.

Moline Pressed Steel Co., East Moline, Ill.

Parish & Bingham Co., Cleveland, O. (See page 295.)

Pfau Mfg. Co., Cincinnati, O.

Rochester Pressed Steel Co., 35-37 Ford St., Rochester, N. Y.

Spiro Mfg. Co., C., 68-72 E. 131st St., New York, N. Y.

Stanwood Equipment Co., 307 Plymouth Ct., Chicago, Ill.

BOARDS, Running, for Fords

(Linoleum, Rubber and Aluminum covered wood boards)

Humboldt Machine & Stamping Co., 81-85 Tenth St., Long Island City, N. Y.

Metal Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

Spiro Mfg. Co., C., 68-72 E. 131st St., New York, N. Y. "Uniq."

Uniq—See Spiro Mfg. Co.

BOATS, FLYING—See Section I

BOATS, MOTOR—See Section I

BODIES, Metal Automobile

(For Wood Automobile Bodies—See Bodies, Wood Automobile)

Abbott & Downing Co., S. Main St., Concord, N. H.

Abresch Co., Chas., Fourth & Poplar Sts., Milwaukee, Wis.

American Body Co., 1255-63 Niagara St., Buffalo, N. Y.

Ames Co., F. A., Owensboro, Ky. "Amesbilt." (See pages 214A and 214B.)

Amesbilt—See Ames Co.

Armstrong Co., M., 433 Chapel St., New Haven, Conn.

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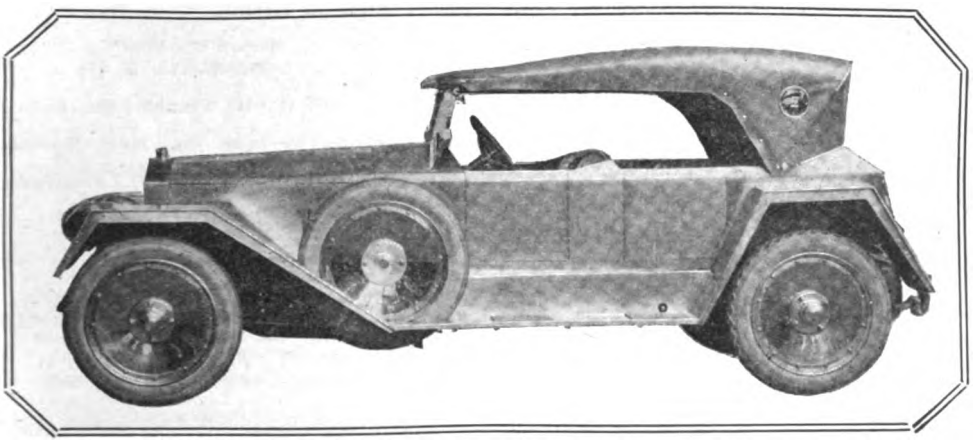
KUNDTZ BODIES

for

MOTOR TRUCKS & AUTOMOBILES



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Let us estimate on your body work—we build bodies in any quantity to standard specifications or to individual custom design.

We have produced fine passenger bodies for Winton—White—Peerless—Stearns—Murray, and a great variety of truck bodies for many of the largest users of motor trucks in America.

Working with wood has been our business since 1875. Our plants now contain 775,554 square feet—our lumber yards over 35 acres and hold 600,000 feet of lumber. We hold in reserve two million feet of logs. We also have facilities for casting small parts in aluminum, brass and bronze and for shaping sheet metal. Every process of body building is done under our own roof, where we employ 1,600 men.

We also specialize in the manufacture of

Steering Wheels
Passenger and
Truck Car Wheels

—and all other wood parts used in motor vehicle construction

THE THEODOR KUNDTZ COMPANY
CLEVELAND, OHIO

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BODIES, Metal Automobile (Continued)

Auto Body Co., Lansing, Mich. (See page 107.)
Auto Metal Body Co., 346-52 Collins Ave., Pittsburgh, Pa.
Auto Metal Co., 531 Worthington St., Springfield, Mass.
Beaudette Co., O. J., Pontiac, Mich.
Biddle & Smart Co., Amesbury, Mass.
Biehls Carriage & Wagon Works, 31 S. Fifth St., Reading, Pa.
Blue Ribbon Body Co., 1720 Fairfield Ave., Bridgeport, Conn.
Bowe Carriage Co., 711 Orange St., Wilmington, Del.
Brewster & Co., Queensboro Bridge Plaza, Long Island City, N. Y.
Briggs Carriage Co., 11 Cedar St., Amesbury, Mass.
Briggs Mfg. Co., Clay Ave., Detroit, Mich.
Brunn & Co., 980 Ellicott St., Buffalo, N. Y.
Brunn's Carriage Mfg. Co., 1140-48 Main St., Buffalo, N. Y.
Budd Mfg. Co., Edward G., Hunting Park Ave. & 25th St., Philadelphia, Pa.
Caffrey Co., Chas. S., Tenth & Market Sts., Camden, N. J.
Carriage Woodstock Co., 401 W. Third St., Owensboro, Ky.
Central Mfg. Co., 18th St. & Columbia Ave., Connersville, Ind.
Collings Carriage Co., Front & Arch Sts., Camden, N. J.
Collins Vehicle Woodwork Co., R. N., 3900 Chouteau Ave., St. Louis, Mo.
Cooling Carriage Co., 402 French St., Wilmington, Del.
Cunningham Son & Co., James, 18 Canal St., Rochester, N. Y.
Currier-Cameron Co., Amesbury, Mass.
Cutter, J. Frank, 30 Amherst St., Cambridge, Mass.
Dayton Body Co., 618-24 Geyer St., N., Dayton, O.
Dunbar Automobile Body Co., Filbert & 37th Sts., Philadelphia, Pa.
Erby & Sons Co., Wm., 121-27 W. Grand Ave., Chicago, Ill.
Erdman-Guider Co., 2290 Woodward Ave., Detroit, Mich.
Farnham-Nelson Co., 47 Union Ave., Boston, Mass.
Fisher Body Corp., St. Antoine St. & M. C. R. R., Detroit, Mich.
Fitz Gibbon & Crisp, Calhoun St. & P. & R. R. R., Trenton, N. J. "Lion."
Flandrau Motor Car Co., 164 Rodney St., Brooklyn, N. Y.
Fleetwood Metal Body Co., Fleetwood, Pa.
Griswold Motor & Body Co., 660 Commonwealth Ave., Detroit, Mich.
Hale-Kilburn Corp., 18th St. & Glenwood Ave., Philadelphia, Pa.
Hayes-Ionia Co., Grand Rapids, Mich.
Hayes Mfg. Co., 481 Maybury Grand Ave., Detroit, Mich.
Hayes & Miller Co., 518-22 E. 57th St., New York, N. Y.
Healey & Co., Broadway & 51st St., New York, N. Y.
Holbrook Co., 166 West End Ave., New York, N. Y.
Hollander & Morrill, Amesbury, Mass.
Judkins Co., J. B., Merrimac, Mass.
Kahler Co., N. Vincennes St. & Monon R. R., New Albany, Ind.
Keystone Vehicle Co., Third St. & Lebanon Valley R. R., Reading, Pa.
Kimball & Co., C. P., Chicago, Ill. (See page 137.)
Kingsbury-Leahy Co., Albany, N. Y.
Kundts Co., Theodor, Cleveland, O. (See page 105.)
Lang Body Co., 106th St., N. W., Cleveland, O.
Limousine-Carriage Mfg. Co., 3515 Michigan Ave., Chicago, Ill.
Lion—See Fitz Gibbon & Crisp.
Locke & Co., 437-53 E. 56th St., New York, N. Y.
MacInnis Bros., 118-22 22d St., Toledo, O.
Martin Truck & Body Corp., York, Pa. (See page 117.)
Mack Mfg. Co., Lancaster, Pa.
Milburn Wagon Co., 3134 Monroe St., Toledo, O.
Miller, Hicks & Hewitt, 509-15 W. 56th St., New York, N. Y.
Monroe Body Co., Osmun St., Pontiac, Mich.
Mount Co., J. W., Maple Ave. & White St., Red Bank, N. J.
Mullins Co., W. H., 182 Franklin St., Salem, O.
New Haven Carriage Co., New Haven, Conn. (See page 107.)
Pettingell Machine Co., 79 Elm St., Amesbury, Mass.
Portland Body Works, Portland, Ind.
Pullar Co., James, 5 Mechanic St., Hartford, Conn.
Racine Mfg. Co., Racine, Wis.
Reiss Body Co., 495 Baker St., Detroit, Mich.
Robbins & Co., Irvin, Mission & Division Sts., Indianapolis, Ind. (See page 865.)
Rubay Co., 1318 W. 78th St., Cleveland, O.
Sargent & Ham Co., 26-30 Bowker St., Boston, Mass.
Schildwachter Carriage Co., Park Ave. & 128th St., New York, N. Y.
Schutte Body Co., Charles, 111 E. King St., Lancaster, Pa.
Seaman Co., W. S., 486 Virginia St., Milwaukee, Wis.
Sidney Mfg. Co., Sidney, O.
Stewart Co., W. F., 1023 Harriet St., Flint, Mich.
Stockbridge Body Co., 130 Union St., Springfield, Mass. (See page 643.)
Superior Body Co., St. George's & Jackson Aves., Rahway, N. J.
Thompson Co., E. J. (Forbes Field), Pittsburgh, Pa.
Troy Mfg. Co., Crawford St. & Big Four Ry., Troy, O.
Union City Body Co., Union City, Ind.
Walker Carriage Co., Merrimac, Mass.
Walker-Wells Co., Amesbury, Mass.
Willoughby Co., Dwyer Ave. & Turner St., Utica, N. Y.
Wright Carriage Body Co., Third Ave. & 24th St., Moline, Ill.
York Body Corp., York, Pa. (See page 117.)
Zimmerman & Sons, F. F., Main St., Waupun, Wis.

BODIES, Metal Commercial Car

(For Wood Commercial Bodies—See Bodies, Wood Commercial; for Dumping Bodies—See Bodies, Special Dumping)

Abbott & Downing Co., S. Main St., Concord, N. H.
Albert Bros., 11-13 Cannon St., New York, N. Y.
American Auto Body Co., 39th St. & Hammond Ave. (North Milwaukee), Milwaukee, Wis.

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MANUFACTURERS OF

FINE AUTOMOBILE BODIES

LANSING, MICH.

NEW HAVEN CARRIAGE CO.

New Haven, Conn.

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as best suited to the stern usage of WAR. Lighter than any other of equal strength—stronger than any other of equal weight—these qualities are just as indispensable in the commercial as in the battlefield.

Take advantage of the cold mechanical analysis of army experts, and demand this construction **in your truck and commercial bodies.**

Handsome catalog showing our complete line of bodies for all chasses mailed promptly on request.

H. H. BABCOCK COMPANY

Founded 1845

Watertown New York

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BODIES, Metal Commercial Car (Continued)

American Body Co., 1255-63 Niagara St., Buffalo, N. Y.

Ames Co., F. A., Owensboro, Ky. "Amesbilt." (See pages 214A and 214B.)

Amesbilt—See Ames Co.

Armstrong-Johnston Mfg. Co., W. First Ave. & Perry St., Columbus, O.

Auburn Wagon Co., 528 W. Race St., Martinsburg, W. Va.

Auto Body Co., Lansing, Mich. (See page 107.)

Auto Metal Co., 531 Worthington St., Springfield, Mass.

Auto Truck Steel Body Co., 3023-46 Carroll Ave., Chicago, Ill.

Babcock Co., H. H., Watertown, N. Y. (See page 107.)

Bee Automobile Co., 15-21 N. Church St., Allentown, Pa.

Biehls Carriage & Wagon Works, 31 S. Fifth St., Reading, Pa.

Bowe Carriage Co., 711 Orange St., Wilmington, Del.

Brown Auto-Carriage Co., 3147 Superior Ave., Cleveland, O.

Budd Mfg. Co., Edward G., Hunting Park Ave. & 25th St., Philadelphia, Pa.

Butler Mfg. Co., 1324 Grand Ave., Kansas City, Mo.

Collins Carriage Co., Front & Arch Sts., Camden, N. J.

Collins Vehicle Woodwork Co., R. N., 3900 Chouteau Ave., St. Louis, Mo.

Columbian Steel Tank Co., 1601-21 W. 12th St., Kansas City, Mo.

Commercial Auto Body & Mfg. Co., 5345 St. Clair Ave., Cleveland, O.

Commercial Motorbody Corporation, 50 E. 42d St., New York, N. Y. (Distributors.) (See page 107.)

Cooling Carriage Co., 402 French St., Wilmington, Del.

Dayton Body Co., 618-24 Geyer St., N., Dayton, O.

Erby & Sons Co., Wm., 121-27 W. Grand Ave., Chicago, Ill.

Erdman-Guider Co., 2290 Woodward Ave., Detroit, Mich.

Eureka—See Lally Commercial Body Co.

Forsyth Bros. Co., McCormick Bldg., Chicago, Ill.

Hayes-Ionia Co., Grand Rapids, Mich.

Heil Co., 26th & Montana Aves, Milwaukee, Wis.

Hendrick Mfg. Co., Carbondale, Pa.

Highland Body Mfg. Co., 716 Elmwood Pl., Cincinnati, O.

Hopkins Mfg. Co. of N. Y., Hanover, Pa.

K-L—See Kingsbury-Leahy Co.

K. & J.—See Kilbourne & Jacobs Mfg. Co.

Kahler Co., N. Vincennes St. & Monen R.R., New Albany, Ind.

Keystone Vehicle Co., Third St. & Lebanon Valley R. R., Reading, Pa.

Kilbourne & Jacobs Mfg. Co., Columbus, O. "K. & J." (See page 109.)

Kingsbury-Leahy Co., Albany, N. Y. "K-L."

Kundtz Co., Theodore, Cleveland, O. (See page 105.)

Lally Commercial Body Co., Paris St., Everett, Mass. "Perfection," "Eureka," "Paragon."

Lang Body Co., 106th St., N. W., Cleveland, O.

McFarlane & Co., H., 526-38 S. Canal St., Chicago, Ill.

Mack Mfg. Co., Lancaster, Pa.

Martin Truck & Body Corp., York, Pa. (See page 117.)

Marx, Geo. B., 196-204 Newell St., Brooklyn, N. Y.

Meckel, Fred L., 9-13 E. 13th St., Chicago, Ill.

Metropolitan Auto & Carriage Co., 430-34 Grand St., Bridgeport, Conn.

New England Truck Co., 86 Lunenburg St., Fitchburg, Mass.

New Haven Carriage Co., New Haven, Conn. (See page 107.)

Niles Car & Mfg. Co., Erie St., Niles, O.

Ohio Welding & Mfg. Co., 814 W. Sixth St., Cincinnati, O.

Paragon—See Lally Commercial Body Co.

Perfection—See Lally Commercial Body Co.

Peters Wagon & Auto Works, 418-20 Ensor St., Baltimore, Md.

Pirsch & Co., Peter, Kenosha, Wis.

Providence Body Co., Providence, R. I.

Robbins & Co., Irvin, Morrison & Division Sts., Indianapolis, Ind. (See page 865.)

Sargent & Ham Co., 26-30 Bowker St., Boston, Mass.

Schildwachter Carriage Co., Park Ave. & 128th St., New York, N. Y.

Schnabel & Sons, G. A., 2410 Penn Ave., Pittsburgh, Pa.

Schoeler Bros, 247 Milwaukee Ave., Milwaukee, Wis.

Schutte Body Co., Charles, 111 E. King St., Lancaster, Pa.

Sior & Son, Heinrich, 245-47 Floyd St., Brooklyn, N. Y.

Stockbridge Body Co., 130 Union St., Springfield, Mass. (See page 643.)

Stover Steel Tank & Mfg. Co., Hancock Ave., Freeport, Ill.

Troy Mfg. Co., Crawford St. & Big Four Ry., Troy, O.

Truck Engineering Co., 7031 Broadway, Cleveland, O.

Universal Body Co., Chicago St., Jonesville, Mich.

Variety Mfg. Co., 340-52 N. Sacramento Blvd., Chicago, Ill.

Whitman Agricultural Co., St. Louis, Mo.

Willoughby Co., Dwyer Ave. & Turner St., Utica, N. Y.

Wright Carriage Body Co., Third Ave. & 24th St., Moline, Ill.

Wright Co., Thomas, 71-73 Colden St., Jersey City, N. J.

York Body Corp., York, Pa. (See page 117.)

Zimmerman & Sons, F. F., Main St., Waupun, Wis.

BODIES, Wood Automobile

(For Metal Automobile Bodies—See Bodies, Metal Automobile)

Abbott & Downing Co., S. Main St., Concord, N. H.

Abresch Co., Chas., Fourth & Poplar Sts., Milwaukee, Wis.

All-Season Body Co., Marshall, Mich.

American Body Co., 1255-63 Niagara St., Buffalo, N. Y.

Ames Co., F. A., Owensboro, Ky. "Amesbilt." (See pages 214A and 214B.)

Amesbilt—See Ames Co.

Amesbury Body Co., Carriage Ave., Amesbury, Mass.

Armstrong Co., M., 433 Chapel St., New Haven, Conn.

Armstrong-Johnston Mfg. Co., W. First Ave. & Perry St., Columbus, O.

Auto Body Co., Lansing, Mich. (See page 107.)

Auto Body & Top Works, 17th Ave. & N. C. R. R., Nashville, Tenn.

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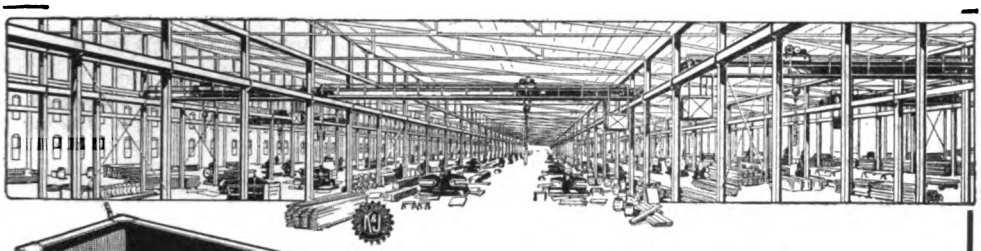

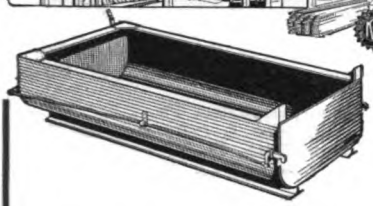

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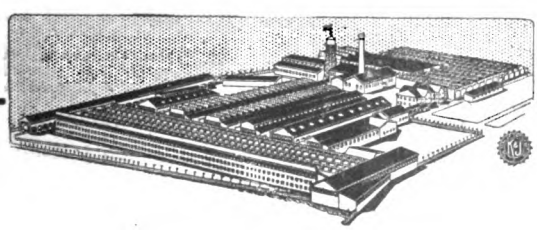

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BODIES, Wood Automobile (Continued)

Auto Metal Co., 531 Worthington St., Springfield, Mass.
Bailey Mfg. Co., North Wales, Pa.
Bela Body Co., Clark St., Amesbury, Mass.
Biehls Carriage & Wagon Works, 31 S. Fifth St., Reading, Pa.
Blaser Body Co., Union & Syracuse Sts., Fostoria, O.
Blue Ribbon Body Co., 1720 Fairfield Ave., Bridgeport, Conn.
Bowe Carriage Co., 711 Orange St., Wilmington, Del.
Brewster & Co., Queensboro Bridge Plaza, Long Island City, N. Y.
Bridgeport Body Co., 365 Fairfield Ave., Bridgeport, Conn.
Brownell & Burt, 12 Washington St., Taunton, Mass.
Brunn & Co., 980 Ellicott St., Buffalo, N. Y.
Brunns' Carriage Mfg. Co., 1140-42 Main St., Buffalo, N. Y.
Central Auto Body Co., 15 Orchard St., Hartford, Conn.
Chicago Carriage & Trimming Co., 3514-20 S. Michigan Ave., Chicago, Ill.
Chicago Coach & Carriage Co., 1223-31 S. Michigan Ave., Chicago, Ill.
Clark Mfg. Co., J. L., Oshkosh, Wis. (See page 115.)
Collings Carriage Co., Front & Arch Sts., Camden, N. J.
Collins Vehicle Woodwork Co., R. N., 3900 Chouteau Ave., St. Louis, Mo.
Cooling Carriage Co., 402 French St., Wilmington, Del.
Cunningham Son & Co., James, 18 Canal St., Rochester, N. Y.
Currier-Cameron Co., 35 Elm St., Amesbury, Mass.
Dann Bros. & Co., 80-88 Franklin St., New Haven, Conn.
Dunbar Automobile Body Co., Filbert & 37th Sts., Philadelphia, Pa.
Earl Automobile Works, 1320 S. Main St., Los Angeles, Cal.
Erby & Sons Co., Wm. 121-27 W. Grand Ave., Chicago, Ill.
Erdman-Guider Co., 2290 Woodward Ave., Detroit, Mich.
Farnham-Nelson Co., 47 Union Ave., Boston, Mass.
Fehring Carriage Co., 601-09 Third St., Columbus, Ind.
Fitz Gibbon & Crisp, Calhoun St. & P. & R. R. R., Trenton, N. J. "Lion."
Flandrau Motor Car Co., 164 Rodney St., Brooklyn, N. Y.
French Motor Body Co., Park Ave. & 144th St., New York, N. Y.
Ghent Motor Car Co., Ottawa, Ill. (See page 51.)
Gregg-Wm. D. Rogers Co., 1926 Arch St., Philadelphia, Pa.
Haberkorn & Co., C. H., Brooklyn & Eighth Sts., Detroit, Mich.
Hayes & Miller Co., 518-22 E. 57th St., New York, N. Y.
Healey & Co., Broadway & 51st St., New York, N. Y.
Henney & Co., John W., Louis Ave., Freeport, Ill. (See page 115.)
Holcker-Elberg Mfg. Co., 16th & McGee Sts., Kansas City, Mo.
Hughey & Son, Wm. J., 2518-20 Michigan Ave., Chicago, Ill.
Kimball & Co., C. P., Chicago, Ill. (See page 137.)
Kingsbury-Leahy Co., Albany, N. Y.
Kundtz Co., Theodor, Cleveland, O. (See page 105.)
Lamco—See Lehman Mfg. Co.
Lang Body Co., 106th St., N. W., Cleveland, O.
Lehman Mfg. Co., Cannelton, Ind. "Lamco."
Limousine-Carriage Mfg. Co., 3515 Michigan Ave., Chicago, Ill.
Lion—See Fitz Gibbon & Crisp.
Locke & Co., 437-53 E. 56th St., New York, N. Y.
Mac Innis Bros., 118-22 22d St., Toledo, O.
McNear, George W., Cambria St., Boston, Mass.
Mack Mfg. Co., Lancaster, Pa.
Manhattan Auto Top & Body Co., 221-23 W. 64th St., New York, N. Y.
Mann-Aldrich Carriage Co., 1300 Lincoln St., Denver, Colo.
Martin Truck & Body Corp., York, Pa. (See page 117.)
Meckel, Fred L., 9-13 E. 13th St., Chicago, Ill.
Mount Co., J. W., Maple Ave. & White St., Red Bank, N. J.
New Haven Carriage Co., New Haven, Conn. (See page 107.)
Rech-Marbaker Co., Eighth St. & Girard Ave., Philadelphia, Pa.
Reiss Body Co., 495 Baker St., Detroit, Mich.
Sargent & Ham Co., 26-30 Bowker St., Boston, Mass.
Schildwachter Carriage Co., Park Ave. & 128th St., New York, N. Y.
Schutte Body Co., Charles, 111 E. King St., Lancaster, Pa.
Sedan Body Co., Union City, Ind.
Seaman Co., W. S., 486-90 Virginia St., Milwaukee, Wis.
Shields Carriage Co., 11 Carriage Ave., Amesbury, Mass.
South Bend Spring Wagon & Carriage Co., 210-16 S. St. Joseph St., South Bend, Ind.
Stockbridge Body Co., 130 Union St., Springfield, Mass. (See page 643.)
Stone & Sons, C., 1658-74 Ogden Ave., Chicago, Ill.
Superior Body Co., St. George's & Jackson Aves., Rahway, N. J.
Terrill Bros., Hamilton & Church Sts., Rahway, N. J.
Troy Mfg. Co., Crawford St. & Big Four Ry., Troy, O.
Turnbull Motor Truck & Wagon Co., Defiance, O. (See page 35.)
Union City Body Co., Union City, Ind.
Walker Carriage Co., Merrimac, Mass.
Walker & Werner, 207-13 Fayette St., Peoria, Ill.
Walton Body Co., 11th St. & Ave. B, New York, N. Y.
Willoughby Co., Dwyer Ave. & Turner St., Utica, N. Y.
Wright Carriage Body Co., Third Ave. & 24th St., Moline, Ill.
Zimmerman & Sons, F. F., Main St., Waupun, Wis.

BODIES, Wood Commercial Car

(For Metal Commercial Bodies—See Bodies, Metal Commercial; for Dumping Bodies—See Bodies, Special Dumping)

Abbott & Downing Co., S. Main St., Concord, N. H.
Abingdon Motor Truck Body Co., Abingdon, Ill.
Abresch Co., Chas., Fourth & Poplar Sts., Milwaukee, Wis.

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Lockswitch *for* Fords

A YALE-LOCKED, irremovable, indestructible, absolutely thief-proof lock for Ford cars. Concealed "ground" contact prevents re-wiring back of dash. Approved by Underwriters' Laboratories, reducing insurance cost 15%.

A fast-selling, eminently satisfactory accessory. Easily the leader of its class.

List Price - - $3.50
In Canada - - $4.50

Steering Column Lock

ATTACHED to steering column, just below wheel. One turn of Yale key locks front wheels rigidly in "straight ahead" position. Car can be shoved backward or forward, but cannot be driven or towed away. Handsome, simple, rugged. Cannot be jimmied or broken. Has appearance of being part of steering column. Not a screw or bolt exposed. Easily and quickly installed.

The best looking and most effective lock on the market.

List Price - - $9.25
Fords, $7.25
In Canada, $12; Fords, $10

Ignition Timers *for* Fords

STANDARD type. Built throughout of very best materials obtainable. A good, dependable, accurate, troubleless instrument.

Immediate deliveries can be made.

List Price - - $1.50
In Canada - - $2.00

Goodrich

AUTOMOTIVE EQUIPMENT

Motor Testing Valve

A DISTINCT improvement over old-style cutout. Never out of order. Outlasts the car. Knife-edged revolving shutter prevents carbon forming and obviates all "sticking" or sluggish operation. Bell-shaped mouth produces loud, clear note, easily heard above conflicting noises. Full-sized opening and direct channel gives instant and entire relief from back pressure.

A Size for Every Car

List Prices	U.S.	Canada
Ford and all 1½"	$3.00	$4.00
1⅝" to 2⅜"....	3.75	5.00
2½" to 2⅞"....	4.75	5.50
3" and over.....	7.50	10.00

Ignition Harness *for* Fords

HEAVILY insulated with best rubber compound. Made of No. 18 gauge copper wire, and covered with heavy cotton braiding, each wire having different colored braid.

Timer Terminal practically unbreakable. The only terminal that works successfully for long period of time on a Ford Timer.

The 4 and 5 wire Primary Sets are all of 18 Gauge Copper wire, but are obtainable in three different styles, loom, flexible metal covered or the popular Standard Braided Type.

Special Prices quoted on Quantity orders

Brake Shoes *for* Fords

One Piece Unlined or Two Piece Lined or Unlined

ALL Shoes of Highest Grade Iron.

Lined Type equipped with Genuine Thermoid Lining or with our less expensive Rival Lining, which is a High Quality Lining, wire inserted. Lining attached with Hungerford Coppered Rivets which wear down evenly with the lining.

Individually Boxed in sets of five.

Quantity Prices Obtainable upon Request

Goodrich-Lenhart Mfg. Co.

Members of National Association Automotive Accessory Jobbers

429 Widener Building **Philadelphia, Pa.**

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BODIES, Wood Commercial Car (Continued)

Albert Bros., 11-13 Cannon St., New York, N. Y.

Alliance Mfg. Co., E. La Rue St., Streator, Ill.

American Auto Body Co., 39th St. & Hammond Ave. (North Milwaukee), Milwaukee, Wis.

American Body Co., 1255-63 Niagara St., Buffalo, N. Y.

American Wagon Co., Dixon, Ill.

Ames Co., F. A., Owensboro, Ky. "Amesbilt." (See pages 214A and 214B.)

Amesbilt—See Ames Co.

Anderson Motor Co., Rock Hill, S. C.

Armstrong-Johnston Mfg. Co., W. First Ave. & Perry St., Columbus, O.

Auburn Wheel & Mfg. Co., Auburn, R. I.

Auto Body Co., Lansing, Mich. (See page 107.)

Auto Body & Top Works, 17th Ave. & N. C. R. R., Nashville, Tenn.

Auto Body Works, Pierce Ave. & Eighth St., Appleton, Wis.

Auto Metal Co., 531 Worthington St., Springfield, Mass.

Babcock Co., H. H., Watertown, N. Y. (See page 107.)

Bailey Mfg. Co., North Wales, Pa.

Bailey & Bowne, Lafayette & Wiley Sts., Utica, N. Y.

Baldwin & Son, D. W., 366 Crown St., New Haven, Conn.

Barrett Mfg. Co., Peter, 127-37 Navy St., Brooklyn, N. Y.

Biehls Carriage & Wagon Works, 31 S. Fifth St., Reading, Pa.

Blue Ribbon Body Co., 1720 Fairfield Ave., Bridgeport, Conn.

Bowe Carriage Co., 711 Orange St., Wilmington, Del.

Bridgeport Body Co., 365 Fairfield Ave., Bridgeport, Conn.

Brill Co., J. G., 62d St. & Woodland Ave., Philadelphia, Pa.

Brown Auto-Carriage Co., 3147 Superior Ave., Cleveland, O.

Brownell & Burt, 12 Washington St., Taunton, Mass.

Central Auto Body Co., 15 Orchard St., Hartford, Conn.

Champion Wagon Co., Owego, N. Y.

Charlotte Wagon & Auto Co., 26 E. Sixth St., Charlotte, N. C.

Chauncey Body Corp., 2601 Archer Ave., Chicago, Ill.

Chicago Carriage & Trimming Co., 3514-20 S. Michigan Ave., Chicago, Ill.

Cincinnati Panel Co., 1938-48 W. Eighth St., Cincinnati, O.

Clark Mfg. Co., J. L., Oshkosh, Wis. (See page 115.)

Collins Carriage Co., Front & Arch Sts., Camden, N. J.

Collins Vehicle Woodwork Co., R. N., 3900 Chouteau Ave., St. Louis, Mo.

Columbia Wagon Co., Columbia, Pa.

Commercial Auto Body Co., 16th & Pine Sts., St. Louis, Mo.

Commercial Auto Body & Mfg. Co., 5345 St. Clair Ave., Cleveland, O.

Commercial Motorbody Corporation, 50 E. 42d St., New York, N. Y. (Distributors.) (See page 107.)

Continental Car Co. of America, 4721 Park Blvd., Highland Park, Ky.

Cooling Carriage Co., 402 French St., Wilmington, Del.

Cope Co., 1082-84 Clinton Ave., Irvington, N. J.

Currier-Cameron Co., 35 Elm St., Amesbury, Mass.

Dann Bros. & Co., 80-88 Franklin St., New Haven, Conn.

Daven-Porter Body Co., Davenport, Ia.

Donegan Auto Body & Specialty Co., 338 Trumbull St., Hartford, Conn.

Donigan & Nielson, 743-47 Third Ave., Brooklyn, N. Y.

Eagle Wagon Works, 45 S. Division St., Auburn, N. Y.

Economy Mfg. Co., 207 W. South St., Indianapolis, Ind.

Erby & Sons Co., Wm., 121-27 W. Grand Ave., Chicago, Ill.

Erdman-Guider Co., 2290 Woodward Ave., Detroit, Mich.

Eureka—See Lally Commercial Body Co.

Eureka Co., Rock Falls, Ill.

Fitz Gibbon & Crisp, Calhoun St., & P. & R. R. R., Trenton, N. J. "Lion."

Fulton-Walker Co., 20th & Filbert Sts., Philadelphia, Pa.

Geissel & Sons, A., 485-87 N. Third St., Philadelphia, Pa.

General Woodwork Co., Cincinnati, O.

Gibbons Truck Body Co., 132 Worcester St., Boston, Mass.

Globe Furniture Co., Northville, Mich.

Golide, Louis, 1874 W. 32d St., Cleveland, O.

Haberer & Co., Gest & Evans Sts., Cincinnati, O.

Hebb Motors Co., 1333 P St., Lincoln, Neb.

Henney & Co., John W., Louis Ave., Freeport, Ill. (See page 115.)

Hesse & Son Mfg. Co., Wm. G., Leavenworth, Kans.

Highland Body Mfg. Co., 716 Elmwood Pl., Cincinnati, O.

Hoover Wagon Co., York, Pa. (See page 219.)

Hopkins Mfg. Co. of N. Y., Hanover, Pa.

Jewett Co., Geo. H., 172-74 Shrewsbury St., Worcester, Mass.

K-L—See Kingsbury-Leahy Co.

Kingsbury-Leahy Co., Albany, N. Y. "K-L."

Kipp Wagon Co., 222 E. 24th st., New York, N. Y.

Klinger Bros. Co., 50 Fulton St., Brooklyn, N. Y.

Koenig & Luhrs Wagon Co., 320 S. Sixth St., Quincy, Ill.

Kratzer Carriage Co., 100 S. First St., Des Moines, Ia.

Kundtz Co., Theodor, Cleveland, O. (See page 105.)

Lally Commercial Body Co., Paris St., Everett, Mass. "Perfection," "Eureka," "Paragon."

Lang Body Co., 106th St., N. W., Cleveland, O.

Lange Wagon Co., H., S. St. Clair & Eva Sts., E. E., Pittsburgh, Pa.

Leaman Co., John M., 680-84 National Ave., Milwaukee, Wis.

Leonhardt Wagon Mfg. Co., 412-20 E. Saratoga St., Baltimore, Md.

Lion—See Fitz Gibbon & Crisp.

Lowell Auto Body Co., Lowell, Mich.

Lyons & Co., Hugh, Lansing, Mich.

McCardell & Co., J. R., S. Warren & Mill Sts., Trenton, N. J.

McDermott Body Corp., 500 Hancock St., Long Island City, N. Y.

McFarlane & Co., 526-38 S. Canal St., Chicago, Ill.

McKay Carriage Co., Grove City, Pa.

Mack Mfg. Co., Lancaster, Pa.

Markley Commercial Body Co., Pontiac, Mich.

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(SINGLE AND DOUBLE ROW)

Whether your requirements demand large or small bearings, our engineering department will help you in selecting the right type of bearing to secure the greatest SERVICE

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Detroit, 936 Woodward Ave. New York City, 1737 B'way
San Francisco, 41 Spear St. St. Louis, 3126 Locust St.
Indianapolis, 822 Hume-Mansur Bldg.
Boston, 159-A Massachu-setts Ave.

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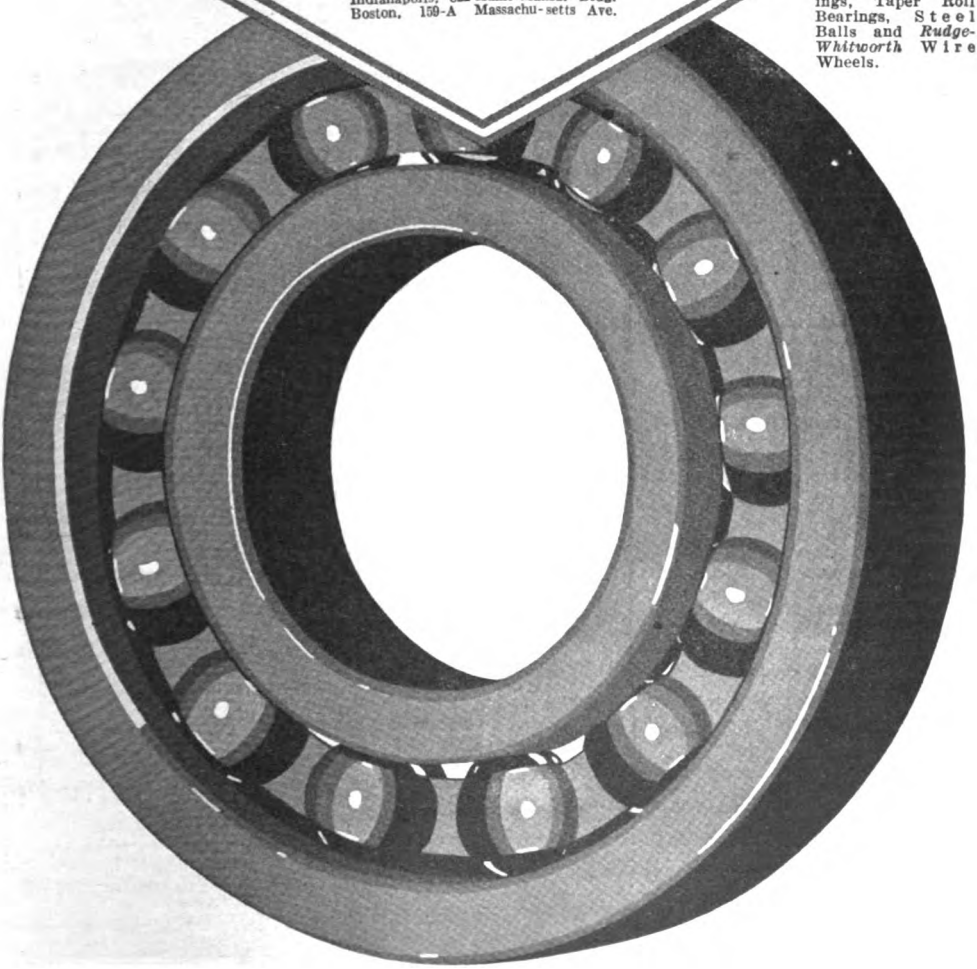

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BODIES, Wood Commercial Car (Continued)

Martin Truck & Body Corp., York, Pa. (See page 117.)

Mertz Co., 704-08 Woodland Ave., Cleveland, O.

Metropolitan Auto & Carriage Co., 430-34 Grand St., Bridgeport, Conn.

Mid-West Mfg. Co., 1547 University Ave., St. Paul, Minn.

Milburn Wagon Co., 3134 Monroe St., Toledo, O.

Miller Co., E. M., Main & Jersey Sts., Quincy, Ill.

Motor Truck Body Co., 611 Central Ave., Detroit, Mich.

Mount Co., J. W., Maple Ave. & White St., Red Bank, N. J.

Mulholland Co., Washington Ave., Dunkirk, N. Y.

National Body & Mfg. Co., 17th & N. C. R. R., Nashville, Tenn.

New England Truck Co., 86 Lunenburg St., Fitchburg, Mass.

New Haven Carriage Co., New Haven, Conn. (See page 107.)

New Ideal Wagon Works, 1345 Park Ave., New York, N. Y.

Nicoulin Dray Mfg. Co., Algona, Ia.

Niederhutt Carriage Co., 3556-62 Walnut St., Denver, Colo.

Paragon—See Lally Commercial Body Co.

Parry Mfg. Co., 110 Parry Ave., Indianapolis, Ind.

Parvis, Jr., & Co., Geo. W., 548-52 Rising Sun Ave., Philadelphia, Pa.

Paterson Vehicle Co., 257-59 Market St., Paterson, N. J.

Perfection—See Lally Commercial Body Co.

Peters Wagon & Auto Works, 418-20 Ensor St., Baltimore, Md.

Pfeiffer Auto & Carriage Works, Wm., 25th Ave. & Leavenworth St., Omaha, Neb.

Providence Body Co., Providence, R. I.

Rech-Marbaker Co., Eighth St. & Girard Ave., Philadelphia, Pa.

Reiss Body Co., 495 Baker St., Detroit, Mich.

Robbins & Co., Irvin, Morrison & Division Sts., Indianapolis, Ind. See page 865.)

Roeder Mfg. Co., Fred., 1396-1400 Atlantic Ave., Brooklyn, N. Y.

Sargent & Ham Co., 26-30 Bowker St., Boston, Mass.

Schaefer Wagon Co., Gustav, 4166-80 Lorain Ave., Cleveland, O.

Schildwachter Carriage Co., Park Ave. & 128th St., New York, N. Y.

Schmitz & Bro., Geo., 666-68 Genesee St., Buffalo, N. Y.

Schnabel & Sons, G. A., 2410 Penn Ave., Pittsburg, Pa.

Schoeler Bros., 247 Milwaukee Ave., Milwaukee, Wis.

Scholl & Son, Anton, 380-82 Flushing Ave., Brooklyn, N. Y.

Schubert Wagon Co., August, 1-3 S. Warner St., Oneida, N. Y.

Schukraft & Sons, Wm., 933-43 Fulton St., Chicago, Ill.

Schutte Body Co., Charles, 111 E. King St., Lancaster, Pa.

Scott Auto Body Co., 2334 Lawrence St., Denver, Colo.

Sebastian Wagon Co., 425 E. 53d St., New York, N. Y.

Shadbolt Mfg. Co., Flushing Ave. & Cumberland St., Brooklyn, N. Y.

Smith Carriage Co., R. J., Lake & Lyell Aves., Rochester, N. Y.

Southwick-Pom Co., 472-80 W. Lafayette Blvd., Detroit, Mich.

Springfield Commercial Body Co., 367 Worthington St., Springfield, Mass.

Standard Auto Top & Body Co., 1338 Race St., Philadelphia, Pa.

Standard Body Co., White Pigeon, Mich.

Stockbridge Body Co., 130 Union St., Springfield, Mass. (See page 643.)

Stunkard Bros. Buggy Co., 24-26 N. Meridian St., Brazil, Ind.

Tegetmeier & Riepe Co., 771-73 First Ave., New York, N. Y.

Trippensee Mfg. Co., 2678 E. Grand Blvd., Detroit, Mich.

Troy Mfg. Co., Crawford St. & Big Four Ry., Troy, O.

Truck Engineering Co., 7031 Broadway, Cleveland, O.

Truck Service Co., Cedar Rapids, Ia.

Uhlenhaut Bros. Wagon Co., 1322-24 Merchant St., St. Louis, Mo.

Union Wheel Works, 51-55 Stanton St., Newark, N. J.

Universal Body Co., Chicago St., Jonesville, Mich.

Walker Carriage Co., Merrimac, Mass.

Waterloo Wagon Co., Waterloo, N. Y.

Whitman Agricultural Co., St. Louis, Mo.

Williamson, Sam, 1800 Texas St., El Paso, Texas.

Willoughby Co., Dwyer Ave. & Turner St., Utica, N. Y.

Wright Carriage Body Co., Third Ave. & 24th St., Moline, Ill.

Wright Co., Thomas, 7178 Colden St., Jersey City, N. J.

York Carriage Co., Franklin & Hay Sts., York, Pa.

York Body Corp., York, Pa. (See page 117.)

Ypsilanti Body Co., Ypsilanti, Mich.

Zimmerman & Sons, F. F., Main St., Waupun, Wis.

BODIES, Special Dumping

(For other Commercial Bodies—See Bodies, Metal Commercial; also Bodies, Wood Commercial)

Archer Iron Works, 34th Pl. & Western Ave., Chicago, Ill. (See page 865.)

Bruder, Lawrence, 211-13 W. Second St., Cincinnati, O.

Columbian Steel Tank Co., 1601-21 W. 12th St., Kansas City, Mo.

Commercial Motorbody Corporation, 50 E. 42d St., New York, N. Y. (Distributors.) (See page 107.)

Eagle Wagon Works, 45 S. Division St., Auburn, N. Y.

Ell-Kay Mfg. Co., 1722 Tracy Ave., Kansas City, Mo.

Fitz Gibbon & Crisp, Calhoun St. & P. & R. R. R., Trenton, N. J. "Lion."

Garage Equipment Co., 3244 Shields Ave., Chicago, Ill.

Graves Co., L. C., Conneautville, Pa.

Heil Co., 26th & Montana Aves., Milwaukee, Wis.

Horizontal Hydraulic Hoist Co., 35 25th St., Milwaukee, Wis. (See page 347.)

K. & J.—See Kilbourne & Jacobs Mfg. Co.

Kilbourne & Jacobs Mfg. Co., Columbus, O. "K. & J." (See page 109.)

Lally Commercial Body Co., Paris St., Everett, Mass.

Lee Loader & Body Co., 2343 S. La Salle St., Chicago, Ill.

Lion—See Fitz Gibbon & Crisp.

Motor Truck Body Co., 611 Central Ave., Detroit, Mich.

New Ideal Wagon Works, 1845 Park Ave., New York, N. Y.

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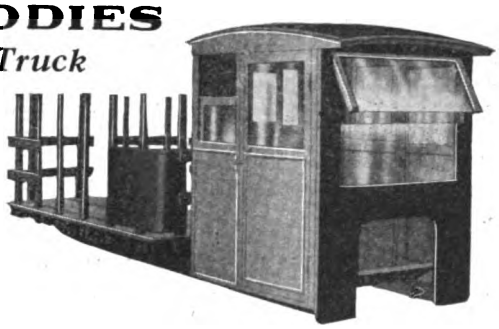
SPECIAL BODIES

for Ford One-Ton Truck

The illustration tells the story. Here is an ideal commercial body, made of the best materials—and represents the best practice in modern motor truck body construction.



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BEARINGS

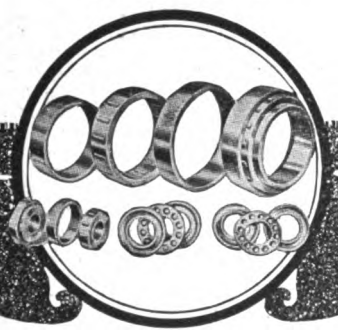
The Right Bearings for Every Part and Every Purpose

We are Specialists on the whole subject of bearings. We understand every phase of this intricate problem. We know the functions and uses of ball bearings and of roller bearings and will give expert advice concerning the use of either.
We make both kinds of bearings and they are the best that can be made. They will stand up and wear indefinitely under the severest test.
Our journal and thrust bearings for automobiles, motor trucks and general machine service have been perfected through years of experience.

STANDARD MACHINERY COMPANY
AUBURN, R. I.

In quantity, price and promptness of delivery we leave nothing to be asked for.

Send blue prints and specifications and we'll solve all the problems.



HENNEY HIGH-GRADE
HEARSE
AMBULANCE
LIMOUSINE AND TAXI-CAB
BODIES

JOHN W. HENNEY & COMPANY
LOUIS AVENUE, FREEPORT, ILLINOIS

Specializing on Bodies for Dodge Brothers Business Chassis.

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BODIES, Special Dumping (Continued)

Press Sons, Jacob, 300 N. Halsted St., Chicago, Ill.

Providence Body Co., Providence, R. I.

Rodenhausen's Excelsior Wagon Works, 1435-37 Hutchinson St., Philadelphia, Pa.

Shadbolt Mfg. Co., Flushing Ave. & Cumberland St., Brooklyn, N. Y.

Sior & Son, Heinrich, 245-47 Floyd St., Brooklyn, N. Y.

Truck Engineering Co., 7031 Broadway, Cleveland, O.

Winsor Gravity Dump Body Co., 601 E. Atwater St., Detroit, Mich.

Wood Hydraulic Hoist & Body Co., 560 Franklin St., Detroit, Mich.

Woonsocket Wagon Mfg. Co., Worrall St., Woonsocket, R. I.

Wright Co., Thomas, 71-73 Colden St., Jersey City, N. J.

BODIES, Special Commercial, for Fords

(Including also commercial bodies to fit all truck attachments and convertible bodies of all types)

Abingdon Motor Truck Body Co., Abingdon, Ill.

Ames Co., F. A., Owensboro, Ky. "Amesbilt." (See pages 214A and 214B.)

Amesbilt—See Ames Co.

Auto Body & Top Works, 17th Ave. & N. C. R. R., Nashville, Tenn.

Auto Body Works, Pierce Ave. & Eighth St., Appleton, Wis.

Babcock Co., H. H., Watertown, N. Y. (See page 107.)

Badger Auto Body Co., Milwaukee, Wis.

Bailey Auto Body & Sales Co., 21st & Olive Sts., St. Louis, Mo.

Barnett Auto Body Co., 430 Golden Gate Ave., San Francisco, Cal.

Biehls Carriage & Wagon Works, 31 S. Fifth St., Reading, Pa.

Brownell & Burt, 12 Washington St., Taunton, Mass.

Buob & Scheu, 500-10 Webster Ave., Cincinnati, O. (See page 711.)

Butler Mfg. Co., 1324 Grand Ave., Kansas City, Mo.

Cantrell & Bro., J. T., Wall St., Huntington, N. Y.

Champion Wagon Co., Owego, N. Y.

Charlotte Wagon & Auto Co., 26 E. Sixth St., Charlotte, N. Car.

Clark Mfg. Co., J. L., Oshkosh, Wis. (See page 115.)

Cleveland Top & Specialty Co., 3102 Franklin Ave., Cleveland, O.

Columbia Wagon Co., Columbia, Pa.

Columbus Body Co. of Detroit, 21-27 Selden Ave., Detroit, Mich.

Commercial Auto Body Co., 16th & Pine Sts., St. Louis, Mo.

Commercial Motorbody Corporation, 50 E. 42d St., New York, N. Y. (Distributors.) (See page 107.)

Eagle Wagon Works, 45 S. Division St., Auburn, N. Y.

Eureka Co., Rock Falls, Ill.

Ford Body Co., 301 N. Green St., Greensboro, N. C.

Geneva Wagon Co., Geneva, N. Y.

Haberer & Co., Gest & Evans Sts., Cincinnati, O.

Hannibal Motor Wagon & Body Co., Tenth & Collier Sts., Hannibal, Mo.

Heath-Duplex—See McCord Mfg. Co.

Heaney & Co., John W., Louis Ave., Freeport, Ill. (See page 115.)

Hercules Buggy Co., Morton Ave., Evansville, Ind.

Highland Body Mfg. Co., 716 Elmwood Pl., Cincinnati, O.

Hill Pump Valve Co.—See Zinke Co.

Hoover Wagon Co., York, Pa. (See page 219.)

Hopp Carriage Co., Mifflinburg, Pa.

Kratzer Carriage Co., 100 S. First St., Des Moines, Ia.

London Auto Supply Co., 2543 Wabash Ave., Chicago, Ill.

McCord Mfg. Co., Detroit, Mich. "Heath-Duplex." (See pages 558 and 559.)

McIntyre Motor Products Co., 100-10 W. 55th St., Chicago, Ill.

McKay Carriage Co., Grove City, Pa.

Martin Truck & Body Corp., York, Pa. (See page 117.)

Mifflinburg Body Co., Mifflinburg, Pa. (See page 117.)

Mid-West Mfg. Corp., 1547 University Ave., St. Paul, Minn.

Monday Co., A. J., 327 Fourth St., Milwaukee, Wis.

Motor Truck Body Co., 611 Central Ave., Detroit, Mich.

Murphy Co., P. J., 6-10 E. Hennepin Ave., Minneapolis, Minn.

Ohio Welding & Mfg. Co., 314 W. Sixth St., Cincinnati, O.

Parry Mfg. Co., 110 Parry Ave., Indianapolis, Ind.

Schmitz & Bro., Geo., 666-68 Genesee St., Buffalo, N. Y.

Springfield Commercial Body Co., 367 Worthington St., Springfield, Mass.

Standard Body Co., White Pigeon, Mich.

Stover Steel Tank & Mfg. Co., Hancock Ave., Freeport, Ill.

Swan Demountable Body Co., 4021 Payne Ave., Cleveland, O.

Texas Wagon Works, 101-07 Crawford St., Houston, Tex.

Truck Engineering Co., 7031 Broadway, Cleveland, O.

Utility—See Zinke Co.

Wardway Vehicle Works, Chicago Heights, Ill. (See page 715.)

Waterloo Wagon Co., Waterloo, N. Y.

Wayne Works, Richmond, Ind.

Whetstone & Co., John H., Lapeer, Mich.

Williams Wagon Works, Third St., Macon, Ga.

Winona Carriage Co., Winona, Minn.

York Body Corp., York, Pa. (See page 117.)

York Carriage Co., Franklin & Hay Sts., York, Pa.

Zinke Co., 1323-25 Michigan Ave., Chicago, Ill. (Sole Distributors for Hill Pump Valve Co., Chicago, Ill. "Utility." (See page 551.)

BODIES, Special Passenger, for Fords

(Including runabout, touring car, special speedster or racing bodies and closed bodies)

Ames Co., F. A., Owensboro, Ky. "Amesbilt." (See pages 214A and 214B.)

Amesbilt—See Ames Co.

Auto Body & Top Works, 17th Ave. & N.C.R.R., Nashville, Tenn.

Auto Remodeling Co., 1503 S. Michigan Ave., Chicago, Ill.

Champion Racing Body Co., 1117 S. Wabash Ave., Chicago, Ill.

Charlotte Wagon & Auto Co., 26 E. Sixth St., Charlotte, N. C.

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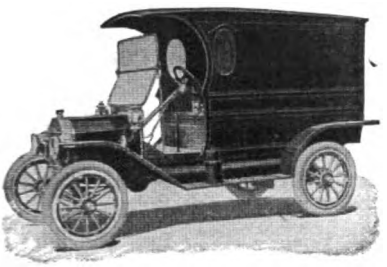
Commercial Bodies for Ford and Maxwell Cars

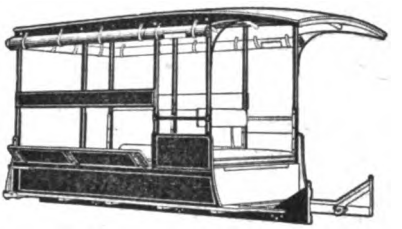


Write for particulars and prices

Designers and Builders of High Grade Commercial Automobile Bodies of Every Description.

The Mifflinburg Body Co.
Mifflinburg, Pa.

Martin Bodies



No. 925 Body

COMPLETE LINE

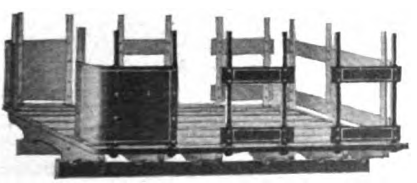
For Standard Chassis
Ford 1 Ton Truck
Ford Extensions
Ford Attachments

Immediate shipment on the standard line

Martin Truck & Body Corp.
YORK PA.

DESIGN, UTILITY and QUALITY

All in one in our line of Commercial Bodies



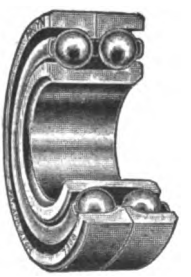
No. 854

Our General Utility Cab with this and other bodies fulfils requirements.

York Body Corporation
York, Pa.

PRUYN BALL BEARINGS

for every purpose



Single Row

Double Row

Thrusts

also—Pruyn Combination Radial and Self Aligning Bearings

Refer your Bearing problems to our Engineer

Pruyn Ball Bearing Works
4408-4410 Paul St Frankford (Phila.), Pa.

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BODIES, Special Passenger, for Fords (Continued)

Columbus Body Co. of Detroit, 21-27 Selden Ave., Detroit, Mich.
Dunham Co., Thos., Aurora, Ill. (See page 75.)
Empire Auto Specialty Co., 1622 S. Wabash Ave., Chicago, Ill.
Hopkins & Co., J., 2420 W. 22d St., Chicago, Ill.
Kelsey Wheel Co., Detroit, Mich. (See page 355.)
Lamco—See Lehman Mfg. Co.
Lehman Mfg. Co., Cannelton, Ind. "Lamco."
Millspaugh & Irish, Indianapolis, Ind.
National Body & Mfg. Co., 17th & N. C. R. R., Nashville, Tenn.
Paco Mfg. Co., 258 Simmons St., Galesburg, Ill.
Pfeiffer Auto & Carriage Works, Wm., 25th Ave. & Leavenworth St., Omaha, Neb.
Selden Mfg. Co., 29 Selden Ave., Detroit, Mich.
Williams Wagon Works, Third St., Macon, Ga.

BODY ANTI-SQUEAK—See Lining, Body or Frame

BODY BUILDERS' CLAMP—See Clamps, Woodworkers

BODY GLASS—See Glass, Polished Plate

BODY HANDLING TRUCKS—See Trucks, Body Handling

BODY HOISTS—See Hoists, Truck Body

BODY IRONS—See Irons, Body

BODY LINING—See Lining, Body or Frame

BODY PADDING—See Lining, Body or Frame

BODY PARTS—See Parts, Wood Automobile Body

BODY POLISH—See Polishes, Automobile Body

BODY STOCK—See Lumber, Automobile; also Aluminum, Sheet; also Steel, Sheet

BOILER ALARMS—See Columns, Water

BOILER COLUMNS—See Columns, Water

BOILER FEED PUMPS—See Pumps, Boiler Feed

BOILER FEED REGULATORS—See Regulators, Water Level

BOILER INJECTORS—See Injectors, Boiler Feeding

BOILER SHELLS—See Shells, Boiler

BOILER TUBE EXPANDERS—See Expanders, Boiler Tube

BOILER WATER GAGES — See Gages, Boiler

BOILERS, Automobile Steam

Ofeldt & Sons, F. W., Nyack, N. Y.
Stanley Motor Carriage Co., 44 Hunt St., Newton, Mass.

BOLT AND SCREW CASES—See Cases, Bolt

BOLT CLIPPERS—See Clippers, Bolt and Rivet

BOLT EXTRACTORS—See Extractors, Stud Bolt

BOLT LUBRICATORS—See Lubricators, Spring and Shackle Bolt

BOLT WRENCHES—See Wrenches, Nut and Bolt

BOLTS, Aeroplane Eye

Automatic Products Co., 1145 W. Grand Blvd., Detroit, Mich. (See page 593.)
Barcalo Mfg. Co., 225 Louisiana St., Buffalo, N. Y.

BOLTS, Aircraft Propeller Hub

Steel Products Co., Cleveland, O. (See page 400.)

BOLTS, CAP—See Screws, Cap and Set

BOLTS, CARRIAGE—See Bolts, Machine and Carriage

BOLTS, Engine, for Fords

Nelson Mfg. Co., A., 2700 Southport Ave., Chicago, Ill.
Whitehouse-LeCompte Mfg. Co., 42-54 Elm St., Newark, N. J.

BOLTS, Machine and Carriage

American Iron & Steel Mfg. Co., Front & Cumberland Sts., Lebanon, Pa.
Clark Bros. Bolt Co., Milldale, Conn.
Columbus Bolt Works Co., Columbus, O. (See page 187.)
Detroit Bolt & Hardware Co., 45-49 Adelaide St., Detroit, Moch.
Eagle—See Skelly Bolt Co.
Falls River Co., Kent, O.
Foster Bolt & Nut Mfg. Co., Union Ave. & E. 72d St., Cleveland, O. "Perfection."
Graham Nut Co., 1317-19 W. Carson St., Pittsburg, Pa.
Haskell Mfg. Co., Wm. H., 24 Commerce St., Pawtucket, R. I.
Haydon, A. & M., 304 N. 22d St., Philadelphia, Pa.
Kirk-Latty Mfg. Co., Madison Ave., Cleveland, O.
Lamson & Sessions Co., 2188 Scranton Rd., Cleveland, O.
Lanz & Sons, Mathew, 2907 Carson St., Pittsburg, Pa.
Michigan Bolt & Nut Works, ft. Meldrume Ave., Detroit, Mich.
National Lock Co., Rockford, Ill. (See page 599.)
National Screw & Tack Co., Cleveland, O. (See page 477.)
Oliver Iron & Steel Co., Pittsburgh, Pa.

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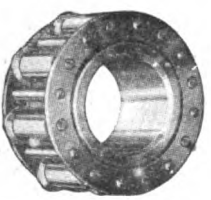
BOWER SAVES POWER

Truck Owners Know the Value of Simplicity

Bower Roller Bearings are of simple, yet scientific design. Consisting of a cylindrical roller with a flanged head at one end, this bearing reduces friction to the minimum. The constant heavy radial load is carried by the entire length of the roller. The side thrust is carried separately by the flange. Hence, the roller is self-aligning and always runs free.

Because of their simple trouble-proof construction and because Bower Bearings never need adjustment, they are prime favorites with truck owners.



BOWER
ROLLER BEARING CO.
Detroit Michigan

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BOLTS, Machine and Carriage (Continued)

Pawtucket Mfg. Co., 327 Pine St., Pawtucket, R. I.
Perfection—See Foster Bolt & Nut Mfg. Co.
Pittsburgh Screw & Bolt Co., Preble Ave. (N. S.), Pittsburgh, Pa.
Republic Iron & Steel Co., Republic Bldg., Youngstown, O.
Rhode Island Tool Co., Providence, R. I.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.
St. Louis Screw Co., Clarence & Bulwer Aves., St. Louis, Mo.
Shelton Co., Shelton, Conn.
Skelly Bolt Co., Thomas P., 24th & Callowhill Sts., Philadelphia, Pa. "Eagle."
Upson Nut Co., Scranton Rd., Cleveland, O.

BOLTS, SHACKLE—See Bolts, Spring Shackle

BOLTS, Special Demountable Rim

BB.—See Bayne Mfg. Co.
Bayne Mfg. Co., Grant & Davis Sts., Bushnell, Ill. "BB."
Hil-Ko Rim Lock Co., 4722 Dilman Blvd., St. Louis, Mo.

BOLTS, Special, for Fords

Acme Mfg. Co., Boonton, N. J.
Bridgers Co., J. D., Irby & Front Sts., Florence, S. C.
Edelmann & Co., E., 341-63 E. Ohio St., Chicago, Ill.

BOLTS, Spring Shackle

(Complete Bolt with Oil or Grease Cup attached)

Bowen Products Corp., Auburn Division, Auburn, N. Y. "Empress." (See page 237.)
Bowen Products Corp., 866 Warren Ave., W., Detroit, Mich. (See page 121.)
Brown Co:, 213 Bellevue Ave., Syracuse, N. Y.
Clark Bros. Bolt Co., Milldale, Conn.
Columbus Bolt Works Co., Columbus, O. (See page 187.)
Empress—See Bowen Products Corp.
Ferry Cap & Set Screw Co., 2155 Scranton Rd., Cleveland, O. (See page 595.)
Ford-Clark Co., 3125 Perkins Ave., Cleveland, O.
Phillips Mfg. Co., R. B., Worcester, Mass.
Steel Products Co., Cleveland, O. (See page 400.)

BOLTS, STEP—See Bolts, Machine and Carriage

BOLTS, Stove and Tire

American Screw Co., 21 Stevens St., Providence, R. I.
Atlas Bolt & Screw Co., 1289 Marquette Rd., N. E., Cleveland, O.
Clark Bros. Bolt Co., Milldale, Conn.
Columbus Bolt Works Co., Columbus, O. (See page 187.)
Detroit Bolt & Hardware Co., 45-49 Adelaide St., Detroit, Mich.
Falls Rivet Co., Kent, O.
Foster Bolt & Nut Mfg. Co., Union Ave. & E. 72d St., Cleveland, O. "Perfection."
Ireland & Matthews Mfg. Co., Beard & Chatfield Sts., Detroit, Mich.
Kirk-Latty Mfg. Co., Madison Ave., Cleveland, O.
Lamson & Sessions Co., 2188 Scranton Rd., Cleveland, O.
National Lock Co., Rockford, Ill. (See page 599.)
National Screw & Tack Co., Cleveland, O. (See page 477.)
Perfection—See Foster Bolt & Nut Mfg. Co.
Reed & Prince Mfg. Co., Duncan Ave., Worcester, Mass.
Russell & Erwin Mfg. Co., New Britain, Conn.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.
Upson Nut Co., Scranton Rd., Cleveland, O.

BOLTS, TIRE—See Bolts, Stove and Tire

BONNETS, MOTOR—See Hoods, Motor

BONNETS, UNDER—See Pans, Dust

BOOKS, Accounting and Cost Systems

Accurate System & Manifolding Co., 12 Elm St., New York, N. Y. (See page 123.)
Comfort Printing Specialty Co., Eighth & Pine Sts., St. Louis, Mo. (See page 123.)
Garage Systems Co., 110 N. Main St., Rockford, Ill.
Harton & Co., Thos. J., 212F Church St., New York, N. Y. (See page 123.)
Tallman, Robbins & Co., 316 W. Superior St., Chicago, Ill.

BOOTS, Motorists' Over

(Fur or felt boots to wear over regular shoe when motoring in cold weather)

Hoenigsberger, A., 12-16 S. Market St., Chicago, Ill.
Putnam & Co., A. H., 154 Maple St., Danvers, Mass.

BOOTS, Steering Knuckle and Joint

(Leather, Oilcloth and Fabric Covers for enclosing Steering Connections and Universal Joints)

Allen Auto Specialty Co., 16 W. 61st St., New York, N. Y. (See page 229.)
Atlas Specialty Mfg. Co., 16-22 E. 24th St., Chicago, Ill. (See page 123.)
B. E. Mfg. Co., 18-22 W. 18th St., New York, N. Y. (See page 223.)
Bailey Co., R. B., 1316 S. Grand Ave., Los Angeles, Cal.
Campbell—See Perkins-Campbell Co.
Carter Co., George R., 1600-20 Kentucky Ave., Connersville, Ind.
Chicago Rawhide Mfg. Co., 1301 Elston Ave., Chicago, Ill.
Chicago Wholesale Saddlery & Mfg. Co., 125-27 N. Halsted St., Chicago, Ill.
Detroit Leather Works, Detroit, Mich. (See page 129.)
Economy Stay Co., Jefferson City, Mo.
Gilbert Mfg. Co., 70-80 Center St., New Haven, Conn.
Hager & Son, Chas., 1926 Broadway, New York, N. Y.
Hide, Leather & Belting Co., 215 S. Meridian St., Indianapolis, Ind. (See page 389.)

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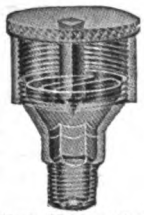
GREASE CUPS WINKLEY SPRING BOLTS

Plain, compressed brass and steel. (Combination means brass cups and steel base.) Patented process makes these Cups wonderfully uniform and practical.

DESCRIPTIVE LIST

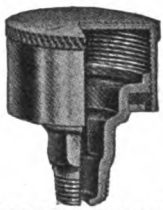
No.	Inside Dia. Cup	Reg. Pipe Thread	Optional Pipe Thread	Optional Female Pipe Thread	In Oz. Capacity
000	¾	⅛	⅛	⅛	½
00	1	¼	¼	¼	1
0	1¼	⅜	⅜	⅜	1¼
1	1¾	½	½	½	3
2	2	½	½	½	5
3	2¾	½	½ & ¾	½	6
4	3	¾	¾	¾	7



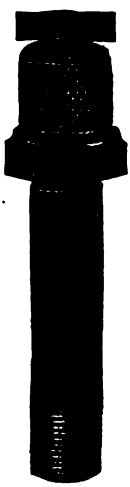
For simplicity, effectiveness and reliability, there is nothing like the RATCHET GREASE CUP. The cap absolutely cannot jar off. Has the appearance of a regular pressed metal cup with locking device entirely inside. Made of brass, steel, or combination. Sizes and description same as the next column.

HINGE TOP OILER

Has greater capacity than cast cups. Furnished in three sizes, namely, ½", 1", 1½". Plain Polished or Nickel Plated finish with ¼" or ½" pipe threads. Construction of Cap enables you to turn same to open in any direction required. Complete line of elbows tapped to size for above cups.



LEATHER WASHER GREASE CUP of pressed metal. Made in brass, steel or combination. LEATHER WASHER prevents grease from working through the threads and gives a tension which keeps the cap from jarring off. Note that LEATHER WASHER is crimped in by our own patented process so that it cannot possibly loosen. Same sizes as plain compressed grease cups given in second column.



"STERLING" SHACKLE BOLTS

Bolts are made of open hearth, pure rolled steel hardened in boiling oil by patented process. "Bar" or round handle fitted with "STERLING" (as shown in cut) or Acorn handle. Assortment of brass furnished in any finish. Plunger type force feed. Very efficient and neat in appearance.

"DUSTPROOF" GREASE CUP

This is a self-locking Cap on which the Cap is locked by a cylindrical dustproof shell. Also made as assembly on shackle bolts. This Cap can be furnished with standard Cap if so desired.

"STERLING" GREASE CUP

(Patented)

This is a force feed leather-packed plunger cap with a locking device in the base. Cannot rattle loose. Handle never projects more than shown in the cut. Also made on Shackle Bolts as shown on this page with or without "bar" head. This is an excellent and standard device.

"ACORN" GREASE CUP

(Patented)

This Cap is constructed the same as the "Sterling" with the exception of the handle, which gives it a very neat appearance. It is becoming very popular with the trade being adaptable for use on shackle bolts.

"WINKLEY" RATCHET BOLTS

Manufactured from same grade of material as Bolt on opposite side of page. Equipped with less expensive assembly. Plain cap made from brass or steel in any finish required. Plunger cast in cap which engages spring in head of bolt. More effective and reliable Ratchet of simple construction on the market. Very economically furnished in large quantities.

"M" OIL HOLE COVER

Opens in any direction by using spout of oil can to tip cover. Closes automatically.

STANDARD PRICE LIST AND SIZES

No.	Diam.	Stock Finish	Thread Optional Pipe Thread	Diam. of Cup	Size of Hole	Price per 100
1	¼	28	⅛	⅝	⅛	$7 00
2	⅜	28	¼	⅞	⅛	9 00
3	½	24	⅜	1	⅛	10 70
4	⅝	24	½	1⅛	⅛	12 00
A	¾	24	½	1⅜	⅛	14 00
5	⅞	24	¾ or ⅝	1⅝	¼	22 00
7	⅞	24	¾	1⅝	¼	24 00
8	⅞	24	¾ or ⅝	1	⅜	32.00

We keep all sizes of taps in stock for others. We always send plated finish and stock threads unless specified otherwise.

Write for samples and prices, stating quantity desired.

Give style and number in ordering.

"N" OIL HOLE COVER

Sets very low. Opened in any direction with oil can spout. Closed automatically.

STANDARD PRICE LIST AND SIZES

No.	Stock Diam.	Thread Finish	Diam. of Hole	Diam. of Cup	List Per 100 Finished
1	¼	28	¼	⅝	$7 00
2	⅜	28	⅜	⅞	9 00
3	½	24	½	1	10 70
4	⅝	24	⅝	1⅛	12 00
5	¾	24	¾	1⅜	14 00

"D" OIL HOLE COVER

Self-locking, dust-proof. Coil spring of piano wire. Always closes it.

STANDARD PRICE LIST AND SIZES

No.	Stock Diam.	Thread Finish	Optional Pipe Thread	Diameter of Cup	List per 100
0	½	28		⅞	$7.00
1	¼	28		⅞	7.00
2	⅜	28		1	9.00
3	½	24	¼	1⅛	10.70
4	⅝	24	⅜	1⅜	12.00
5	¾	24	½	1⅝	14.00

"A" HOLE OIL COVER

Made with shoulder at top to drive in when assembled. Self-closing, dust-proof. Requires the use of only one hand of operator.

STANDARD PRICE LIST AND SIZES

No.	Diameter	Length	Drive Into	List per 100
0-A	¼	⅞	¼	$4.00
1-A	⅜	1	⅜	5.00
2-A	½	1⅛	½	6.25
3-A	⅝	1⅜	⅝	7.50
4-A	¾	1⅝	¾	8.75
5-A	⅞	1⅝	⅞	10.00
6-A	1	1⅝	1	12.00

Nickel Plated Oilers always seat.

"K" OIL HOLE COVER

Has a flat shoulder which provides means of screwing into bearing. Self-closing, dust-proof. Extends slightly.

LIST OF STANDARD SIZES AND PRICES

No.	Diameter Hole	Thread	List per 100
20-K	¼	.281-28	$4.00
21-K	⅜	.406-24	4.70
22-K	½	.531-24	5.50
23-K	⅝	.656-24	6.00
24-K	¾	.781-24	7.00
25-K	⅞	.906-24	10.00
26-K	1	1.031-24	12.00

"C" OIL HOLE COVER

Not self-closing, but easily closed by hand. Screw-driver slot. Cannot come apart.

STANDARD PRICE LIST AND SIZES

No.	Thread	Optional Pipe Thread	Diameter of Cup	List per 100
0	.10-32		⅞	$7.00
1	10-32		⅞	7.00
2	1/4-28		1	9.00
3	3/8-24	⅛	1⅛	10.70
4	1/2-24	¼	1⅜	12.00
5	5/8-24	⅜	1⅝	14.00

BOWEN PRODUCTS CORPORATION
Successors to
866 Warren Ave. W. The Winkley Co. Detroit, Michigan

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BOOTS, Steering Knuckle and Joint (Continued)

Hoover Co., W. H., New Berlin, O.
Nathan Novelty Mfg. Co., 84-90 Reade St., New York, N. Y. (See page 153.)
Niagara Fabric Mfg. Co., 47 Greene St., New York, N. Y.
Perkins-Campbell Co., 634 Broadway, Cincinnati, O. "Campbell." (See page 227.)
Reinhold Belting & Supply Co., 499 Atlantic Ave., Brooklyn, N. Y.
Smith & Son, James, 40-42 Franklin Ave., Brooklyn, N. Y.
Stevens & Bro., A. A., 1234 Wabash Ave., Chicago, Ill.
Sutherland Co., F. L., 139 Beaubien St., Detroit, Mich. (See page 523.)

BOOTS, Steering Knuckle, for Fords

(Leather, Oilcloth and Fabric Covers for enclosing Steering Connections)

Atlas Specialty Mfg. Co., 16-22 E. 24th St., Chicago, Ill. (See page 123.)
Campbell—See Perkins-Campbell Co.
Nathan Novelty Mfg. Co., 84-90 Reade St., New York, N. Y. (See page 153.)
Perkins-Campbell Co., 634 Broadway, Cincinnati, O. "Campbell." (See page 227.)

BOOTS, TOP—See Covers, Top

BORERS, AIRCRAFT PROPELLER HUB—See Machines, Aircraft Propeller Hub Boring

BORING BARS—See Bars, Boring

BORING HEADS—See Heads, Boring

BORING MACHINES—See Machines, Boring; also Machines, Propeller Boring; also Machines, Aircraft Propeller Hub Boring

BORING MILL CHUCKS—See Chucks, Boring Mill

BOUQUET HOLDERS—See Holders, Bouquet

BOW CLAMPS—See Holders, Top

BOW CLAMPS FOR FORDS—See Clamps, Top Bow

BOW DRESSING MACHINES—See Machines, Top Bow Dressing

BOW HOLDERS—See Holders, Top

BOW RESTS—See Rests, Bow

BOW SEPARATORS—See Separators, Bow

BOW SOCKETS—See Sockets, Bow

BOWS, Top

Brown & Co., S. N., 111 Commercial St., Dayton, O.
Campbell & Dann Mfg. Co., Tullahoma, Tenn.
Conestoga Bending Works, 545 N. Market St., Lancaster, Pa.
Dann Bros. & Co., 80-88 Franklin St., New Haven, Conn.
Delphos Bending Co., Delphos, O.
Detroit Wood Pulley Co., 1331-37 Bellevue Ave., Detroit, Mich.
Empire Bending Works, 110 S. Christian St., Lancaster, Pa.
Lehzelter & Son Co., Philip, Lancaster, Pa. (See page 669.)
Milliken, Geo. W., Muncie, Ind.
Mossman, Yarnelle & Co., Pearl St. & Maiden Lane, Fort Wayne, Ind.
Myco—See Wayne Spoke & Bending Works.
Shepard & Sons, H. G., James & River Sts., New Haven, Conn.
Starr, D. H., Highland, N. Y.
Steelclad Auto Bow Co., Holland, Mich.
Union Bow Co., 725-35 Superior Ave., N. W., Cleveland, O.
Wayne Spoke & Bending Works, Fort Wayne, Ind. "Myco."
Wayne Steering Wheel & Bow Co., Wayne, Mich.
Wheel & Wood Bending Co., 141 John St., Bridgeport, Conn.

BOX LOCKS—See Locks, Cabinet and Pad; also Catches, Spring

BOX PROTECTORS FOR FORDS—See Protectors, Coil Box

BOXES, BATTERY—See Boxes, Metal Battery; also Boxes, Wood Battery

BOXES, BATTERY, FOR FORDS—See Boxes, Tool

BOXES, Hose

(Cast or pressed boxes for installing at curb for free air service)

Eco—See Western Mfg. Co.
Hale Electric & Engineering Co., Schofield Bldg., Cleveland.
Western Mfg. Co., Oskaloosa, Ia. "Eco."

BOXES, LUNCH—See Hampers, Touring

BOXES, Metal Battery

A. Z. Co., 530 W. 56th St., New York, N. Y. (See page 563.)
Corcoran-Victor Co., 712 Reading Rd., Cincinnati, O. "Victor."
Cornwall Mfg. Co., E. 128th St. & Penobscot Ave., Cleveland, O.
Detroit Auto Specialty Co., 909-11 Greenwood Ave., Detroit, Mich.
Globe Machine & Stamping Co., 1250 W. 76th St., Cleveland, O.
Hayes Mfg. Co., 481 Maybury Grand Ave., Detroit, Mich.
Hunt & Dorman Mfg. Co., 1600 E. 24th St., Cleveland, O.
Metal Auto Parts Co., Industrial Bldg., Indianapolis, Ind.
Mitchell & Son, G. F., 6501 Cedar Ave., Cleveland, O.
Sly Mfg. Co., W. W., Cleveland, O.
Standard Steel Box Co., Bridgeville, Pa.
Victor—See Corcoran-Victor Co.

BOXES, Metal Tool

(For Tool Bags—See Bags, Tool)

A. Z. Co., 530 W. 56th St., New York, N. Y. (See page 563.)
Corcoran-Victor Co., 712 Reading Rd., Cincinnati, O. "Victor."
Cornwall Mfg. Co., E. 128th St. & Penobscot Ave., Cleveland, O.

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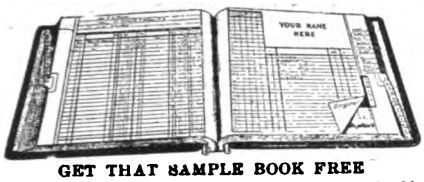

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Chicago, Ill.

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BOXES, Metal Tool (Continued)

Detroit Auto Specialty Co., 909-11 Greenwood Ave., Detroit, Mich.
Globe Machine & Stamping Co., 1250 W. 76th St., Cleveland, O.
Gray Specialty Co., 148 Avon Ave., Newark, N. J.
Hayes Mfg. Co., 481 Maybury Grand Ave., Detroit, Mich.
Lawco—See Lawson Co.
Lawson Co., F. H., Dept. D., Cincinnati, O. "Lawco." (See page 663.)
Metal Auto Parts Co., Industrial Bldg., Indianapolis, Ind.
Mitchell & Sons, G. F., 6501 Cedar Ave., Cleveland, O.
Standard Steel Box Co., Bridgeville, Pa.
Victor—See Corcoran-Victor Co.

BOXES, Metal Tool, for Fords

Metal Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

BOXES, Motor Boat Stuffing

Eisenbrandt, F. B., Light St., Baltimore, Md.
Monarch Valve Co., 112 Front St., Brooklyn, N. Y.
Upson-Walton Co., 1310 W. 11th St., Cleveland, O.
Wilcox-Crittenden & Co., 83 Main St., Middletown, Conn.

BOXES, Motor Boat Underwater Exhaust

(See also Mufflers)

Koven & Bro., L. O., 154 Ogden Ave., Jersey City, N. J.

BOXES, Motorcycle Metal Battery

International Stamping Co., 400-12 N. Leavitt St., Chicago, Ill.

BOXES, Motorcycle Metal Tool

International Stamping Co., 400-12 Leavitt St., Chicago, Ill.

BOXES, Sand

(For attaching to car for sanding slippery roads to prevent skidding)

Surface Grip Corp., 4 W. 21st St., Baltimore, Md.

BOXES, Sheet Metal Tote

(Shop Boxes and Barrels)

Acme Sheet Metal & Mfg. Co., 2343 Lakeside Ave., Cleveland, O.
Allsteelequip Co., 150 Stone Ave., Aurora, Ill.
Clark Co., W. J., 190 Depot St., Salem, O.
Cleveland Wire Spring Co., Cleveland, O.
Hetts Co., Detroit, Mich.
Hart & Hutchinson Co., New Britain, Conn.
Kilbourne & Jacobs Mfg. Co., Columbus, O. (See page 109.)
Leetonia Boiler Co., Leetonia, O.
Lyon Metallic Mfg. Co., Aurora, Ill.
N. B.—See New Britain Machine Co.
New Britain Machine Co., 10 Bigelow St., New Britain, Conn. "N. B." (See page 659.)
Ohio Mfg. Co., Painesville, O.
Scaife & Sons Co., Wm. B., Pittsburgh, Pa. (See pages 683 and 723.)
Sterling Wheelbarrow Co., 64th & Pullen Aves., Milwaukee, Wis.

BOXES, SPARE LAMP BULB—See Cases, Extra Lamp Bulb

BOXES, Spark Coil

Churchill Cabinet Co., 2119 Churchill St., Chicago, Ill.
Haberkorn & Co., C. H., Brooklyn & Eighth Sts., Detroit, Mich.
Standard Cabinet Mfg. Co., Peru, Ind.
Wabash Cabinet Co., Wabash, Ind.
West Box Co., F. M., 225 Liberty St., Springfield, Mass.

BOXES, SPRING OILING—See Cups, Spring Leaf Lubricating

BOXES, TOOL—See Boxes, Metal Tool; also Boxes, Wood Tool

BOXES, Tool and Battery, for Fords

(Metal Tool and Battery Boxes for use on running board)

Corcoran Mfg. Co., 4634 Spring Grove Ave., Cincinnati, O.
Corcoran-Victor Co., 712 Reading Rd., Cincinnati, O. "Victor."
Globe Machine & Stamping Co., 1250 W. 76th St., Cleveland, O.
Hayes Mfg. Co., 481 Maybury Grand Ave., Detroit, Mich.
Mitchell & Son, G. F., 6501 Cedar Ave., Cleveland, O.
Oakes Co., Indianapolis, Ind. (See page 279.)
Victor—See Corcoran-Victor Co.

BOXES, TOTE—See Boxes, Sheet Metal Tote

BOXES, Wood Battery

(See also Holders, Battery)

American Body Co., 1255-63 Niagara St., Buffalo, N. Y.
Blakeley, W. W., 100 Leicester Ct., Detroit, Mich.
Churchill Cabinet Co., 2119 Churchill St., Chicago, Ill.
Standard Cabinet Mfg. Co., Peru, Ind.
Tollner's Sons Co., Chas., 17 Furnace St., Pulaski, N. Y.
West Box Co., F. M., 225 Liberty St., Springfield, Mass.

BOXES, Wood Tool

(For Tool Bags—See Bags, Tool)

American Body Co., 1255-63 Niagara St., Buffalo, N. Y.
Haberkorn & Co., C. H., Brooklyn & Eighth Sts., Detroit, Mich.
Standard Cabinet Mfg. Co., Peru, Ind.
Tollner's Sons Co., Chas., 17 Furnace St., Pulaski, N. Y.
West Box Co., F. M., 225 Liberty St., Springfield, Mass.

BRACES, FENDER, FOR FORDS—See Braces, Mud Guard

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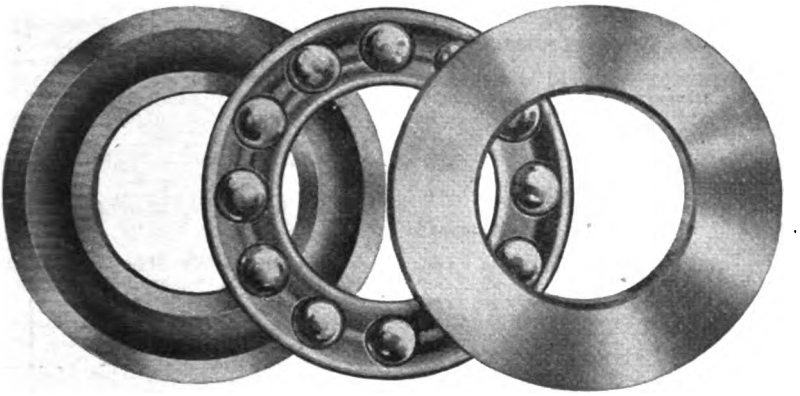

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BRACES, Mud Guard or Fender, for Fords

(Small metal clamps for fastening mud guard and apron together to prevent rattling)

BB.—See Bayne Mfg. Co.

Bayne Mfg. Co., Grant & Davis Sts., Bushnell, Ill. "BB."

Cooper Mfg. Co.—See Fulton Co.

Edelmann & Co., E., 341-63 E. Ohio St., Chicago, Ill.

Fulton Co., 1910 St. Paul Ave., Milwaukee, Wis. (Sole Distributors for Cooper Mfg. Co., Marshalltown, Ia.) (See page 139.)

Humboldt Machine & Stamping Co., 81-85 Tenth St., Long Island City, N. Y.

Mazura Mfg. Co., 414 S. Sixth St., St. Louis, Mo.

Metal Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

Nelson Mfg. Co., A., 2700 Southport Ave., Chicago, Ill.

New Era Spring & Specialty Co., 1138 Hamilton St., N. W., Grand Rapids, Mich. (See page 355.)

Star Specialty Mfg. Co., 227-33 W. Erie St., Chicago, Ill.

Whitehouse-LeCompte Mfg. Co., 42-54 Elm St., Newark, N. J.

BRACES, Running Board, for Fords

(Fittings to reinforce or supplement the running board hangers to eliminate sagging of the running boards)

BB—See Bayne Mfg. Co.

Bayne Mfg. Co., Grant & Davis Sts., Bushnell, Ill. "BB."

Casey Asco Mfg. Co., 1504 Grand Ave., Kansas City, Mo.

Dow Wire & Iron Works, Franklin, Buchanan & Pocahontas Sts., Louisville, Ky.

Dunham Co., Thos., Aurora, Ill. (See page 75.)

Ford Relief Spring & Frame Supporter Co., 7 E. 42nd St., New York, N. Y.

H. & M.—See Radius Rod Co.

Mazura Mfg. Co., 414 S. Sixth St., St. Louis, Mo.

Metal Specialties Mfg. Co., 338-52 N. Kedzie Ave., Chicago, Ill. "Presto." (See page 333.)

Presto—See Metal Specialties Mfg. Co.

Radius Rod Co., Lamoni, Ia. "H. & M."

Shurnuff Mfg. Co.—See Zinke Co.

Simplex Mfg. Co., Jackson St. & C. I. Ry., Anderson, Ind.

Star Specialty Mfg. Co., 227-33 W. Erie St., Chicago, Ill.

Vaughn-Harris Co., Vermilion, S. Dak.

Walker Mfg. Co., Hamilton & Michigan Sts., Racine, Wis.

Williams Wagon Works, Third St., Macon, Ga.

Zinke Co., 1323-25 Michigan Ave., Chicago, Ill. (Sole Distributors for Shurnuff Mfg. Co., St. Louis, Mo.)

BRACES, Steering Column, for Fords

(Brace to attach to dashboard to steady steering column)

Apco Mfg. Co., Eddy St., Providence, R. I.

Evergood—See Grossman Mfg. Corp.

Grossman Mfg. Corp., Emil, Bush Terminal Bldg., No. 20, Brooklyn, N. Y. "Evergood."

Malco—See Malton Specialty Co.

Malton Specialty Co., 755 Boylston St., Boston, Mass. "Malco."

BRACKETS, Automatic Headlight

(Interconnected with Steering Gear so as to turn headlights with front wheels and illuminate the road around turns ahead of car)

Cawley Glare Control Co., 102 Broadway, Buffalo, N. Y.

Culver-Stearns Mfg. Co., Detroit, Mich. (See page 381.)

Faw, J. H., 37 Warren St., New York, N. Y. (Eastern and Southern Distributors for Culver-Stearns Brackets.) (See page 387.)

Pennock—See Specialty Mfg. Co.

Petty Dirigible Headlight Co., McIntyre Bldg., Salt Lake City, Utah.

Specialty Mfg. Co., Minerva, O. "Pennock."

BRACKETS, Automatic Headlight, for Fords

(Interconnected with steering gear so as to turn headlights with front wheels and illuminate the road around turn ahead of car)

Michigan Auto Products Co., Detroit, Mich. "Ospeco." (See page 605.)

Ospeco—See Michigan Auto Products Co.

BRACKETS, Headlight

Cleveland Hardware Co., 4500 Hamilton Ave., Cleveland, O.

National Jack & Mfg. Co., 130-34 S. Clinton St., Chicago, Ill.

S. B. R. Specialty Co., 17-19 Princeton St., East Orange, N. J.

BRACKETS, HEADLIGHT, FOR FORDS—See Brackets, Automatic Headlight

BRACKETS, Side and Tail Lamp

Central Brass & Fixture Co., Dept. A., Springfield, O. (See page 137.)

Imperial Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill. (See page 733.)

Metal Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

Smith & Co., Jos. N., E. Grand Blvd. & Dubois St., Detroit, Mich.

Strieby & Foote Co., 301 Ogden St., Newark, N. J.

Western Brass Mfg. Works, Marshall Blvd., 21st St. & C., B. & Q R. R., Chicago, Ill.

BRACKETS, Timer Elevating, for Fords

Thomas-Andrews Corp., Waukegan, Ill. (See page 861.)

BRAKE BANDING FOR FORDS—See Lining, Brake

BRAKE-BANDING CUTTERS—See Cutters, Brake Lining

BRAKE BANDS—See Brakes, Expanding and Contracting; also Lining, Brake

BRAKE CABLE—See Rope, Steel Wire

BRAKE DRUMS—See Drums, Brake

BRAKE EQUALIZERS FOR FORDS—See Equalizers, Brake

BRAKE FACING—See Lining, Brake

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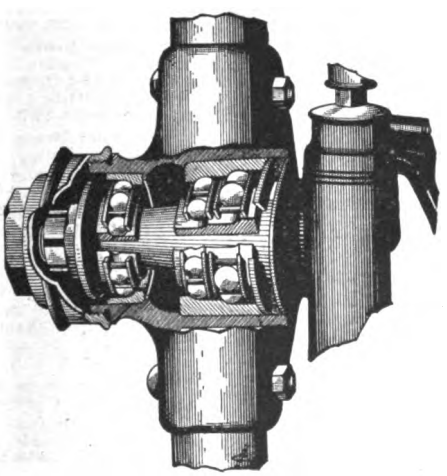

ARRANGEMENT OF SALISBURY BALL BEARINGS FOR FRONT AXLES

For front axles, the use of these bearings ensures free running wheels, without shake or wobble. Note how the bearing takes care of thrust as well as radial loads.

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For transmissions, differentials, propeller shafts, jack shafts, etc., these bearings are dependably reliable.

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BRAKE LINING—See Lining, Brake

BRAKE LINING CUTTERS—See Cutters, Brake Lining

BRAKE PEDALS—See Pedals, Ratchet

BRAKE ROD ANTI - RATTLERS FOR FORDS—See Anti-Rattlers, Brake Rod; also Supports, Brake Rod

BRAKE ROD GUIDES FOR FORDS—See Supports, Brake Rod

BRAKE ROD SUPPORTS FOR FORDS—See Supports, Brake Rod

BRAKE RODS—See Rods, Brake

BRAKE SHOES FOR FORDS—See Shoes, Brake

BRAKES, COASTER—See Brakes, Motorcycle Coaster

BRAKES, CONTRACTING—See Brakes, Expanding and Contracting

BRAKES, CONTRACTING FOR FORDS—See Brakes, Emergency Contracting

BRAKES, Electric

Hartford, Edward V., 172 Morgan St., Jersey City, N. J. (See page 607.)

BRAKES, Emergency Contracting. for Fords

(External contracting band brakes designed to operate on regular brake drum)

Bennett Mfg. Co., 461 Second St., Oakland, Cal.

Dyer Co., G. H., Cambridge, Mass. "Holdford." (See page 505.)

Holdford—See Dyer Co.

Master Equipment Co., 2200 S. Main St., Los Angeles, Cal.

Perfection Parts Co., 4208 Glenway Ave., Cincinnati, O.

Pervier, William A., 20-30 Washington St., Brookline, Mass.

Pla Safe Co., Brookville, Pa.

Rischmuller Mfg. Co., 3442 19th St., San Francisco, Cal.

Tractor-Train Co., 1346 Wall St., Los Angeles, Cal.

BRAKES, Expanding and Contracting

Dunco—See Dunkirk Corp.

Dunkirk Corp., 16 E. Second St., Dunkirk, N. Y. "Dunco."

Duplex—See Raybestos Co.

Raybestos Co., Bridgeport, Conn. "Raymond," "Duplex." (See page 341.)

Raymond—See Raybestos Co.

BRAKES, Motorcycle Coaster

Eclipse Machine Co., Elmira, N. Y. "Morrow." (See page 345.)

Morrow—See Eclipse Machine Co.

New Departure Mfg. Co., Bristol, Conn. (See page 95.)

BRASS CASTINGS—See Castings, Bronze and Brass

BRASS CHECKS—See Checks, Brass Time, Tool and Pay

BRASS HAMMERS—See Hammers, Brass and Copper

BRASS, IRON LINED TUBING—See Tubing, Iron Lined

BRASS MALLETS—See Hammers, Brass and Copper

BRASS MELTING FURNACES—See Furnaces, Brass Melting

BRASS RADIATOR CAPS—See Caps, Brass Radiator

BRASS RIVETS—See Rivets, Brass

BRASS, ROD—See Brass and Copper, Sheet and Rod

BRASS, SHEET—See Brass and Copper, Sheet and Rod

BRASS TESTING INSTRUMENTS—See Instruments, Metal Testing

BRASS TUBING—See Tubing, Brass

BRASS and COPPER, Sheet and Rod

(For Tubing—See Tubing, Brass; for Castings—See Castings, Brass and Bronze)

American Brass Co. (Ansonia Brass & Copper Branch), Ansonia, Conn.

American Brass Co. (Coe Brass Branch), Torrington, Conn.

American Brass Co. (Benedict & Burnham Branch), Waterbury, Conn.

American Brass Co. (Waterbury Brass Branch), 26 Crane St., Waterbury, Conn.

American Brass Co. (Kenosha Branch), Kenosha, Wis.

American Brass Products Co., Woolworth Bldg., New York, N. Y. (Dealers.) (See page 799.)

Bridgeport Brass Co., E. Main St., Bridgeport, Conn.

Buffalo Copper & Brass Rolling Mill, Military Rd. & Hertel Ave., Buffalo, N. Y.

Chase Rolling Mill Co., Waterbury, Conn.

Connecticut Brass & Mfg. Corp., Waterbury, Conn.

Dallas Brass & Copper Co., Chicago, Ill. (Dealers.) (See page 259.)

Detroit Copper & Brass Rolling Mills, Clark Ave. & Wabash R. R., Detroit, Mich.

Manhattan Brass Co., 328 E. 28th St., New York, N. Y.

Michigan Copper & Brass Co., 1611 Jefferson Ave., W., Detroit, Mich. "Wolverine."

Midwest Brass & Copper Co., 6 Church St., New York, N. Y. (Dealers.) (See page 459.)

New Haven Copper Co., Seymour, Conn.

New Jersey Tube Co., Newark, N. J.

Plumb & Atwood Mfg. Co., 470 Bank St., Waterbury, Conn.

Randolph-Clowes Co., Waterbury, Conn.

Rome Brass & Copper Co., Rome, N. Y.

Scovill Mfg. Co., Waterbury, Conn. (See page 659.)

Seymour Mfg. Co., Seymour, Conn.

Stamford Rolling Mills Co., Springdale, Conn.

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Friction-Proof Lubricant Co., Des Moines, Iowa.

Wilmo Manifolds,
The Whittier Co., Chicago, Ill.

Osgood Lens,
Osgood Lens & Supply Co., Chicago, Ill.

Neutralocks,
The H-R Mfg. Co., Chicago, Ill.

Air Compressors,
The A-F-S Machine Co., Toledo, Ohio.

Hi-Comp Piston Rings,
Continental Piston Ring Co., Memphis, Tenn.

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BRASS and COPPER, Sheet and Rod (Continued)

Taunton-New Bedford Copper Co., Taunton, Mass.

Winchester B. & C. Co., Winsted, Conn.

Wolverine—See Michigan Copper & Brass Co.

BRAZIERS, CAST IRON — See Welding, Autogenous

BRAZING COMPOUNDS—See Compounds, Brazing

BRAZING FLUX—See Compounds, Brazing

BRAZING TORCHES—See Torches, Gasoline; also Torches, Acetylene; also Machines, Autogenous Welding

BREAST DRILLS—See Drills, Breast

BREATHER PIPES FOR FORDS — See Breathers, Crank Case

BREATHERS, Crank Case, for Fords

(Breather pipe with large filler opening to take the place of steel cap on small oil filling hole on front end of motor)

Apco Mfg. Co., Eddy St., Providence, R. I.

Bear Mfg. Co., E. 17th St. & First Ave., Rock Island Ill.

Bowen Products Corp., Auburn Division, Auburn, N. Y. "Empress." (See page 237.)

Crum-Wiley Mfg. Co., Peru, Ind.

Empress—See Bowen Products Corp.

Excelsior Auto Parts & Supply Co., 200 Cannon St., Bridgeport, Conn.

Greer, Fredric, 525 W. Van Buren St., Chicago, Ill.

Humboldt Machine & Stamping Co., 81-85 Tenth St., Long Island City, N. Y.

Protex Mfg. Co., 13-17 N. Jefferson St., Chicago, Ill. (See page 275.)

BROACHING PRESSES—See Presses, Broaching

BROADCLOTH, Upholstery

(See also Trimmings, Cloth and Carpet)

American Mills Co., 17th St. & Fourth Ave., New York, N. Y.

Laidlaw Co., 16 W. 60th St., New York, N. Y. (See page 191.)

Roy Woolen Co., Watervliet, N. Y.

Slater & Sons, Webster, Mass.

Waterloo Woolen Mfg. Co., 228 E. Main St., Waterloo, N. Y.

BROKERS, Financial

(Covering only Brokers who Advertise in this Publication)

Commercial Credit Co., Baltimore, Md. (See page 789.)

Commonwealth Finance Corp., 100 Broadway, New York, N. Y. (See page 339.)

Continental Guaranty Corp., 244 Madison Ave., New York, N. Y. (See page 133.)

BRONZE, BEARING—See Metals, Bearing

BRONZE BUSHINGS—See Metals, Bearing

BRONZE CASTINGS—See Castings, Bronze and Brass

BRONZE PAINTS—See Paints, Aluminum

BRONZE ROPE—See Rope, Bronze Wire

BRONZE TESTING INSTRUMENTS—See Instruments, Metal Testing

BRONZE WIRE ROPE—See Rope, Bronze Wire

BROOMS, Steel Wire

(For cleaning garage and shop floors)

American Wire Brush Co., 202-04 Centre St., New York, N. Y. "Minerva."

Cleveland-Osborn Mfg. Co., 5401 Hamilton Ave., N. E., Cleveland, O.

Minerva—See American Wire Brush Co.

BRUSHES, CAR WASHING—See Washers, Vehicle

BRUSHES, GENERATOR—See Brushes, Magneto

BRUSHES, Magneto, Starter and Generator

(Carbon, Metal and Woven Wire)

American Carbon & Battery Co., East St. Louis, Ill.

Becker Bros., 23-25 N. Jefferson St., Chicago, Ill. (See page 131.)

Brown & Caine, 2112 Michigan Ave., Chicago, Ill. (See 493.)

Chapin Co., Chas. E., 201 Fulton St., New York, N. Y. (See page 153.)

Colebaugh Self Lubricating Carbon Co., 1503 Columbia Ave., Philadelphia, Pa.

Ebco—See Electric Brush Co.

Electric Brush Co., Dover, N. J. "Ebco."

Gilfillian Bros. Smelting & Refining Co., 217 W. Sixth St., Los Angeles, Cal.

Graphite Metallizing Corp., 1050 Nepperhan Ave., Yonkers, N. Y.

Jeandron, W. J., 172 Fulton St., New York, N. Y. (Importer.) "Le Carbone."

Le Carbone—See Jeandron, W. J.

National Carbon Co., Cleveland, O. "Pyramid." (See page 131.)

Niehoff & Co., Paul G., 232-42 E. Ohio St., Chicago, Ill. (See page 541.)

Ohio Carbon Co., 1976 Fulton Place, Cleveland, O. (See page 131.)

Pyramid—See National Carbon Co.

Speer Carbon Co., Theresa St., St. Marys, Pa.

Stackpole Carbon Co., St. Marys, Pa.

BRUSHES, Paint and Varnish

Aeron—See De Vilbiss Mfg. Co.

Boars Head—See Fisher-Mitchell Co.

Bowditch, John F., 166 Commercial St., Boston, Mass.

Bradley & Smith, 251 Pearl St., New York, N. Y.

Burton & Co., A. E., 75 Pearl St., Boston, Mass.

Clinton & Co., E., 2119 Arch St., Philadelphia, Pa.

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Becker Brothers

MANUFACTURERS

Brushes

Of All Types for

AUTOMOBILES, STATIONARY DYNAMOS and MOTORS

Write for Catalog

23 and 25 North Jefferson St., Chicago, Ill.

QUALITY SERVICE

OHIO CARBON PRODUCTS

STARTING MOTOR AND LIGHTING GENERATOR

BRUSHES

for

AUTOMOBILES
MOTOR VEHICLES
AIRPLANES—TRACTORS

made by

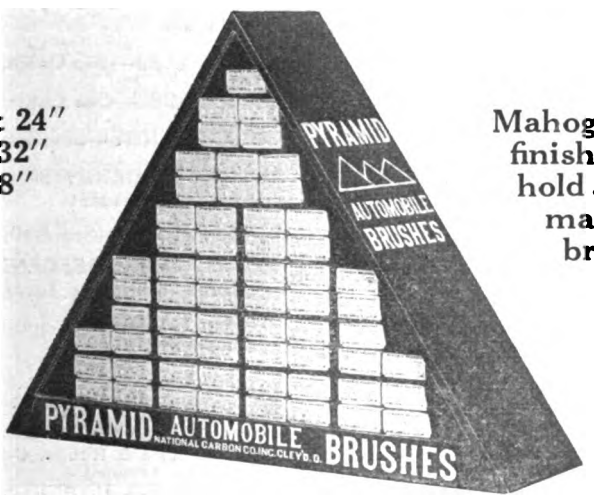
Ohio Carbon Co.

1976 Fulton Place
CLEVELAND, OHIO, U. S. A.

WRITE TODAY

Pyramid Automobile Brush Display Cabinet

Cabinet 24" High x 32" Wide x 8" Deep.



Mahogany finish. Will hold approximately 500 brushes.

This attractive display cabinet answers a long-felt want for a combination display and stock container for PYRAMID BRUSHES. It will help in the sale of these brushes for renewals. PYRAMID BRUSHES are standard equipment for starting motors and lighting generators. This in itself is the best reason why they should be used for renewals.

Get a Pyramid Brush Cabinet from your jobber or direct from us if he cannot supply you. The cabinet is free with a quantity order or is sold outright.

National Carbon Company, Inc., Cleveland, Ohio

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BRUSHES, Paint and Varnish (Continued)

De Vilbiss Mfg. Co., 1270 Dorr St., Toledo, O. "Aeron."

Devoe & C. T. Raynolds Co., F. W., 101 Fulton St., New York, N. Y.

Eclipse Air Brush & Compressor Co., 79 Orange St., Newark, N. J.

Fisher-Mitchell Co., 186 Mitchell St., New York, N. Y. "Boars Head."

Gerts, Lumbard & Co., 221 W. Randolph St., Chicago, Ill.

Hanlon & Goodman Co., 270-72 Pearl St., New York, N. Y.

Miles Bros. & Co., 1957-67 Pitkin Ave., Brooklyn, N. Y.

Monumental—See Rennous, Kleinle & Co.

Packard Co., A., 166 Commercial St., Boston, Mass.

Rennous, Kleinle & Co., 3221 Frederick Ave., Baltimore, Md. "Monumental."

Rodriguez, R. E., 56-58 Warren St., New York, N. Y.

Rubberset Co., 56 Ferry St., Newark, N. J.

Thayer & Co., P. E., Pawtucket, R. I.

Thum, Chas. D., 150 N. Third St., Philadelphia, Pa.

United Brush Manufactories, 203-05 Lafayette St., New York, N. Y.

Whiting-J. J. Adams Co., John L., Boston, Mass. (See page 725.)

BRUSHES, Spark Plug

(Small Wire or Bristle Brushes for cleaning Spark Plugs)

American Wire Brush Co., 202-04 Centre St., New York, N. Y.

BRUSHES, STARTER—See Brushes, Magneto.

BRUSHES, VARNISH—See Brushes, Paint and Varnish

BRUSHES, WASHING—See Washers, Vehicle

BRUSHES, WHEEL—See Washers, Vehicle

BUCKETS, Collapsible

(Collapsible or Folding Pails or Buckets for carrying in car for filling Radiators)

Boko—See Defiance Welding Co.

Defiance Welding Co., Defiance Bldg., Defiance, O. "Boko."

Duplex—See Planet Co.

Faultless—See Zinke Co.

Goodrich Co., B. F., S. Main St., Akron, O.

Goodyear Rubber Co., 787 Broadway, New York, N. Y.

Gordon Co., J. P., 303 N. Fourth St., Columbus, O. (See page 225.)

Hinson—See Powers Mfg. Co.

Holden Mfg. Co., 409 N. Franklin Ave., St. Paul, Minn. "Wash-U-pail."

Martin Mfg. Co., Forest Rose Ave., Lancaster, O.

National Mfg. Co.—See Zinke Co.

Planco—See Planet Co.

Planet Co., 180 N. Elm St., Westfield, Mass. "Duplex," "Planco."

Powers Mfg. Co., 1340 Sycamore St., Waterloo, Ia. "Hinson."

Roberts Co., C. F., 278 Brush St., Detroit, Mich.

Scott-Omaha Tent & Awning Co., 1501 Howard St., Omaha, Neb.

Specialty Shop, 1752-54 E. 17th St., Cleveland, O.

Wash-U-pail—See Holden Mfg. Co.

Whitall-Tatum Co., 46-48 Barclay St., New York, N. Y.

Willsden. S. Blake, 29 E. Madison St., Chicago.

Zinke Co., 1323-25 Michigan Ave., Chicago, Ill. (Sole Distributors for National Mfg. Co., Des Moines, Ia. "Faultless."

BUCKLES, Aircraft Safety

Seavey Machine Works, Eugene, 359 Pearl St., New York, N. Y.

BUCKLES, Strap

Anchor—See North & Judd Mfg. Co.

Eberhard Mfg. Co., 2734 Tennyson Rd., Cleveland, O.

Frazer & Jones Co., Syracuse, N. Y. (See page 327.)

North & Judd Mfg. Co., New Britain, Conn. "Anchor." (See page 521.)

O'Brien Mfg. Co., Joseph F.; 391 Broadway, New York, N. Y.

Woodruff & Sons Co., Walter W., Mount Carmel, Conn.

BUCKLES, TURN—See Turn-Buckles

BUFFERS, ELECTRIC PORTABLE — See Drills, Electric Portable

BUFFING COMPOUNDS—See Compounds, Buffing

BUFFING WHEELS—See Wheels, Buffing

BUILDERS' CLAMPS—See Clamp, Woodworkers

BUILDINGS, PORTABLE — See Garages, Portable

BULB BOXES—See Cases, Extra Lamp Bulb

BULB CASES—See Cases, Extra Lamp Bulb

BULB GUARDS—See Guards, Horn Bulb

BULBS, HEADLIGHTS—See Lamps, Miniature Incandescent

BULBS, HORN—See Bulbs, Rubber Horn

BULBS, INCANDESCENT LAMP — See Lamps, Miniature Incandescent

BULBS, LAMP—See Lamps, Miniature Incandescent

BULBS, Rubber Horn

Davol Rubber Co., Providence, R. I.

Firestone Tire & Rubber Co., Miller & Sweitzer Aves., Akron, O.

Goodrich Co., B. F., S. Main St., Akron, O.

Mechanical Rubber Co., C. & P. & Nickel Plate R. R., Cleveland, O.

Parker, Stearns & Co., 236 Sheffield Ave., Brooklyn, N. Y.

Pennsylvania Rubber Co., Jeannette, Pa.

Tyer Rubber Co., Andover, Mass. "Tyrian."

Tyrian—See Tyer Rubber Co.

United States Tire Co., Broadway & 58th St., New York, N. Y. (See page 695.)

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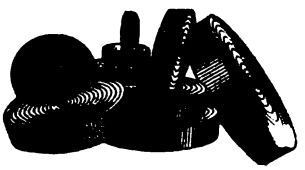
AUTO AUCTION COMPANY

517-519 W. JACKSON BLVD.
CHICAGO, ILL.

Specialists in Surplus Auto Accessories, Axles, Bodies, Wheels, Motors, Transmissions, Tires and Tubes

AT BARGAIN PRICES GET OUR LIST

AUTOMOTIVE LEATHER EQUIPMENT



FAN BELTS—for all makes of cars and motor trucks—pulley belting in all sizes, single or double.

Be sure the belt you buy is marked "KAENJAY"—it's a guarantee of perfect service and that the belt is made of best oak - tanned leather, specially treated to give long service under all conditions.

Inquiries solicited for belts of special construction.

Auto Leather Mfg. Co., Inc.
35 Warren St. New York City

Automobile Banking

RESPONSIBLE automobile and truck dealers who can meet proper credit requirements will find a service here that is assisting hundreds of dealers throughout the United States and Canada in handling credit sales and stocking new cars.

Guaranty Banking Service is open to progressive dealers who appreciate what specialized banking facilities such as we offer can do for them.

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BUMPERS, Automobile

(For protecting Lamps and Radiators; also for rear of car)

American Metal Parts Co.—See Fulton Co.

American Pulley Co., 4200 Wissahickon Ave., Philadelphia, Pa.

Au-To Compressor Co., Wilmington, O. "Oro."

Autoguard—See Stewart-Warner Speedometer Corp.

Badger Mfg. Corp., Milwaukee, Wis. "Simplex," "Protex," "Clover Leaf," "Presto." (See page 139.)

Buckeye—See Central Brass & Fixture Co.

Bull Dog—See Toledo Cable Co.

Cambria Spring Co., 913-21 S. Santee St., Los Angeles, Cal.

Central Brass & Fixture Co., Dept. A, Springfield, O. "Buckeye," "Champion," "Standard." (See page 137.)

Champion—See Central Brass & Fixture Co.

Champion—See Zinke Co.

Chicago—See Western Brass Mfg. Works.

Clover Leaf—See Badger Mfg. Corp.

Conover—See New Jersey Tube Co.

Conqueror—See Zinke Co.

Cox Brass Mfg. Co., N. Pearl & Van Wert Sts., Albany, N. Y. "E-Z."

Detroit—See General Appliance Co.

Diamond—See Sager Co.

E G Mfg. Co., 250 W. 54th St., New York, N. Y. (Dealers.) (See page 215.)

E-Z—See Cox Brass Mfg. Co.

Evergood—See Grossman Mfg. Corp.

Excel—See Zinke Co.

Fit-All—See Sager Co.

Ford-Clark Co., 3125 Perkins Ave., Cleveland, O.

Fulton Co., 1910 St. Paul Ave., Milwaukee, Wis. (Sole Distributors for American Metal Parts Co., Milwaukee, Wis.) (See page 139.)

Gemco Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. "Universal." (See page 135.)

General Appliance Co., 19th St. & Western Ave., Chicago, Ill. "Detroit."

Grossman Mfg. Corp., Emil, Bush Terminal Bldg., No. 20, Brooklyn, N. Y. "Evergood."

Halladay Co., L. P., 501 N. Monroe St., Streator, Ill. "Universal," "Simplex."

Harroun—See Turner Brass Works.

Hartford, Edward V., 172 Morgan St., Jersey City, N. J. (See page 607.)

Hercules—See Zinke Co.

Hercules Spring Bumper Co., 1777 Broadway, New York, N. Y.

Hoover Spring Co., 617-37 Turk St., San Francisco, Cal.

Kimball & Co., C. P., Chicago, Ill. (See page 137.)

Loscalzo, Angelo, 340 E. 27th St., New York, N. Y.

Lyon—See Metal Stamping Co.

McGregor—See U. S. Auto Bumper Co.

Metal Stamping Co., 13th St. & Boulevard, Long Island City, N. Y. "Lyon." "Metsco."

Metsco—See Metal Stamping Co.

Milwaukee Auto Engine & Supply Co.—See Zinke Co.

New Era Spring & Specialty Co., 1138 Hamilton St., N. W., Grand Rapids, Mich. (See page 355.)

New Jersey Tube Co., Newark, N. J. "Conover."

Oro—See Au-To Compressor Co.

Presto—See Badger Mfg Corp.

Protex—See Badger Mfg. Corp.

Protex Mfg. Co., 13-17 N. Jefferson St., Chicago, Ill. (See page 275.)

Sager Co., J. H., 36-38 S. Water St., Rochester, N. Y. "Diamond," "Simplex," "Fit-All.

Simplex—See Badger Mfg. Corp.

Simplex—See Halladay Co.

Simplex—See Sager Co.

Standard—See Central Brass & Fixture Co.

Star Brass Works, 2623 McGee Ave., Kansas City, Mo.

Sterling—See Zinke Co.

Stewart - Warner Speedometer Corp., Chicago, Ill. "Autoguard." (See page 499.)

Toledo Cable Co., 506 S. St. Clair St., Toledo, O. "Bull Dog."

Turner Brass Works, Sycamore, Ill. "Harroun."

U. S. Auto Bumper Co., 115 E. 30th St., Chicago, Ill. "McGregor."

United States Spring Co., 1120-26 S. Los Angeles St., Los Angeles Cal.

Universal—See Gemco Mfg. Co.

Universal—See Halladay Co.

Universal Shock Eliminator, 6-8 W. 62d St., New York, N. Y.

Waukee—See Zinke Co.

Western Brass Mfg. Works, Marshall Blvd., 21st St. & C., B. & Q. R. R., Chicago, Ill. "Chicago."

Zinke Co., 1323-25 Michigan Ave., Chicago, Ill. (Sole Distributors for Milwaukee Auto Engine & Supply Co., Milwaukee, Wis.) "Hercules." "Conqueror," "Champion," "Excel." "Waukee," "Sterling."

BUMPERS, for Fords

(For protecting Lamps and Radiators; also for rear of car)

American Metal Parts Co.—See Fulton Co.

Autoguard—See Stewart-Warner Speedometer Corp.

Badger Mfg. Corp., Milwaukee, Wis. (See page 139.)

Central Brass & Fixture Co., Dept. A., Springfield, O. (See page 137.)

Cox Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y. "E-Z."

E-Z—See Cox Brass Mfg. Co.

Evergood—See Grossman Mfg. Corp.

Ford-Clark Co., 3125 Perkins Ave., Cleveland, O.

Fulton Co., 1910 St. Paul Ave., Milwaukee, Wis. (Sole Distributors for American Metal Parts Co., Milwaukee, Wis.) (See page 139.)

Gemco Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. (See page 135.)

General Appliance Co., 19th St. & Western Ave., Chicago, Ill.

Grossman Mfg. Corp., Emil, Bush Terminal Bldg., No. 20, Brooklyn, N. Y. "Evergood."

Halladay Co., L. P., 501 N. Monroe St., Streator, Ill.

Hercules—See Zinke Co.

Hercules Spring Bumper Co., 1777 Broadway, New York, N. Y.

Hoover Spring Co., 617-37 Turk St., San Francisco, Cal.

International Stamping Co., 400-12 N. Leavitt St., Chicago, Ill.

Lyon—See Metal Stamping Co.

Metal Stamping Co., 13th St. & Boulevard, Long Island City, N. Y. "Lyon."

Milwaukee Auto Engine & Supply Co.—See Zinke Co.

New Era Spring & Specialty Co., 1138 Hamilton St., N. W., Grand Rapids, Mich. (See page 355.)

Perfect—See Pratt Mfg. Co.

Pratt Mfg. Co., Wm. E., 35 W. Lake St., Chicago, Ill. "Perfect."

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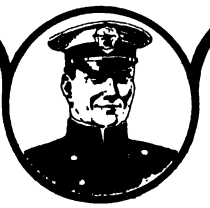
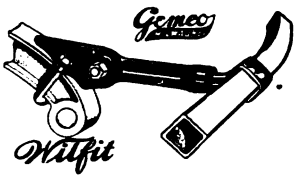
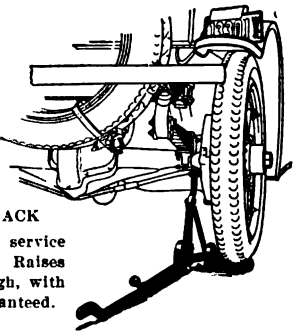


GEMCO ACCESSORIES continue standard, each in its particular field, best for the motorist and most profitable in the end for the dealer. "GEMCO" never appeared on a poor accessory. Write for dealers' proposition.



Fits practically all cars. Diamond or channel bar. Several sizes.

Liberal dealers' discounts.



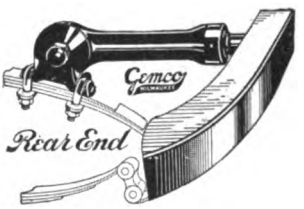
"ONE STROKE" SERVICE JACK

Unequalled for garages and tire service stations. No fussy adjustments. Raises any car, heavy or light, low or high, with one easy stroke. Absolutely guaranteed.

Popular with Ford owners. Bracket resembles front end of big car chassis. Diamond or channel bar. Several sizes.

Liberal dealers' discounts.

TIRE DISPLAY STAND. A silent salesman that makes tires "move." Holds any tire of from 3 to 6 inches without adjustments. Panel for name or display card. Simple, durable, fool-proof. You need it in your business.

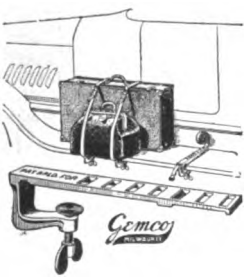


Fills growing demand for rear bumpers. Diamond or channel bar. Several sizes.

Liberal dealers' discounts.

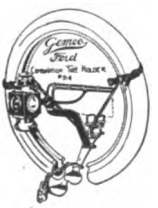
TILTING STEERING WHEEL

Replaces standard Ford wheel and Chevrolet "490" without mechanical alterations. A joy to every Ford and Chevrolet owner—and sells accordingly. 17-inch wheel, plain or corrugated rim. Black luster finish.



LUGGAGE CARRIER

Quickly attachable to running board of any car with two thumb screws. Conveniently holds grips or parcels of many sizes. Rolls compactly when not needed. Sells on sight.



COMBINATION TIRE CARRIER FOR FORDS. Holds spare tire, lamp and license in one convenient attachment. No drilling or mechanical changes to attach. Complete with straps.

Gemco Mfg. Co., 666 So. Pierce Street, Milwaukee, Wis.

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BUMPERS for Fords (Continued)

Protex Mfg. Co., 13-17 N. Jefferson St., Chicago, Ill. (See page 275.)

R & R Mfg. Co., 208 La Salle St., Chicago, Ill.

Sager Co., J. H., 36-38 S. Water St., Rochester, N. Y.

Stewart-Warner Speedometer Corp., Chicago, Ill. "Autoguard." (See page 499.)

Western Brass Mfg. Works, Marshall Blvd., 21st St. & C. B. & Q. R. R., Chicago, Ill.

Zinke Co., 1323-25 Michigan Ave., Chicago, Ill. (Sole Distributors for Milwaukee Auto Engine & Supply Co., Milwaukee, Wis. "Hercules.")

BUMPERS, Spring

(Rubber or Spiral Spring Bumpers to prevent car frame from striking axle)

American Rubber & Tire Co., 100 Beech St., Akron, O.

Boston Belting Co., 84 Lindon Park St., Boston, Mass.

Bridge Web Tire Co., 2962 Prairie Ave., Chicago, Ill.

Cincinnati Rubber Mfg. Co., Cincinnati, O. (See page 361.)

Combination Rubber Mfg. Co., Bloomfield, N. J.

Continental Rubber Works, 1902 Liberty St., Erie, Pa.

Empire Rubber & Tire Co., Mulberry St. & Clinton Ave., Trenton, N. J.

Essex Rubber Co., Trenton, N. J.

Federal Rubber Co. (Cudahy), Milwaukee, Wis.

Goodrich Co., B. F., S. Main St., Akron, O.

Goodyear Tire & Rubber Co., Akron, O. (See page 361.)

Hewitt Rubber Co., 240 Kensington Ave., Buffalo, N. Y.

Mattson Rubber Co., Lodi, N. J.

Mechanical Rubber Co., 307 W. Randolph St., Chicago, Ill.

Mechanical Rubber Co., C. & P. & Nickel Plate R. R., Cleveland, O.

New Jersey Car Spring & Rubber Co., Wayne & Brunswick Sts., Jersey City, N. J.

New York Belting & Packing Co., 91 Chambers St., New York, N. Y.

Pennsylvania Rubber Co., Jeannette, Pa.

Petley Rubber Mfg. Co., 241 Oregon St., Milwaukee, Wis. (See page 453.)

Thermoid Rubber Co., Trenton, N. J. (See pages 373 and 397.)

United States Tire Co., Broadway & 58th St., New York, N. Y. (See page 695.)

Voorhees Rubber Mfg. Co., 18-46 Bostwick Ave., Jersey City, N. J.

BURLAP, Importers of

American Bag Co., Memphis, Tenn.

Bemis Bro. Bag Co., 700 S. Fourth St., St. Louis, Mo.

Bemis-Indianapolis Bag Co., Indianapolis, Ind.

Central Bag Mfg. Co., 3622-30 Iron St., Chicago, Ill.

Fulton Bag & Cotton Mills, Atlanta, Ga.

Milwaukee Bag Co., Milwaukee, Wis.

Reach & Co., Herman, 23 Beaver St., New York, N. Y.

Riegel Sack Co., Woolworth Bldg., New York, N. Y.

BURNER CLEANERS—See Cleaners, Acetylene Burner

BURNERS, Acetylene Lamp

Alco—See American Lava Co.

Ambo—See American Lava Co.

American Lava Co., Chattanooga, Tenn. "Alco," "De Luxe," "No-Name," "Ambo," "Hilo," "Duro," "Hexo."

Aurora—See Steward Mfg. Co.

Bray Elta—See Crane Co.

Bray Luta—See Crane Co.

Bray Roni—See Crane Co.

Brilliant—See Monosmith Bros. Co.

Carroll, J. B., 3057 Carroll Ave., Chicago, Ill. "Hahn."

Crane Co., William M., 16-20 W. 32d St., New York, N. Y. (Importers.) "Bray Roni," "Bray Elta," "Bray Luta."

Crescent—See Kirchberger & Co.

De Luxe—See American Lava Co.

Drake Acetylene Burner Co., 1915 Mission St., San Francisco, Cal.

Duro—See American Lava Co.

Hahn—See Carroll, J. B.

Hexo—See American Lava Co.

Hilo—See American Lava Co.

Kirchberger & Co., M., 374-80 Second Ave., New York, N. Y. "Crescent," "Von Schwartz," "Perfection," "Koro," "Matador," "Victory."

Koro—See Kirchberger & Co.

Matador—See Kirchberger & Co.

Monosmith Bros. Co., 500 S. Main St., Spencer, O. "Brilliant."

No-Name—See American Lava Co.

Novelty Burner Co., Chattanooga, Tenn. "Queen Eta."

Perfection—See Kirchberger & Co.

Queen Eta—See Novelty Burner Co.

Standard Acetylene Burner Co., Tasso, Tenn.

Starr—See Steward Mfg. Co.

Steward Mfg. Co., D. M., Chattanooga, Tenn. "Wonder," "Star," "Aurora."

Tennessee Burner Mfg. Co., Chattanooga, Tenn. "X-L."

Victory—See Kirchberger & Co.

Von Schwartz—See Kirchberger & Co.

Wonder—See Steward Mfg. Co.

X. L.—See Tennessee Burner Mfg. Co.

BURNERS, Special Acetylene Lamp

(Automatic and Electric Lighting Burners; See also Lighters, Acetylene Lamp)

Alco Chicago—See American Lava Co.

American Lava Co., Chattanooga, Tenn. "Alco Chicago."

BURNERS, Gasoline and Kerosene

(For Steam Boilers)

Ofeldt & Sons, F. W., Nyack, N. Y.

Simmons, H. C., North Burlington, Vt.

BUSHING EXTRACTORS FOR FORDS—See Extractors, Bushing

BUSHING PULLERS FOR FORDS—See Extractors, Bushing

BUSHING REMOVERS FOR FORDS—See Extractors, Bushing

BUSHING SWEDGING PRESSES—See Presses, Bushing Swedging

BUSHINGS, BRONZE—See Metals, Bearing

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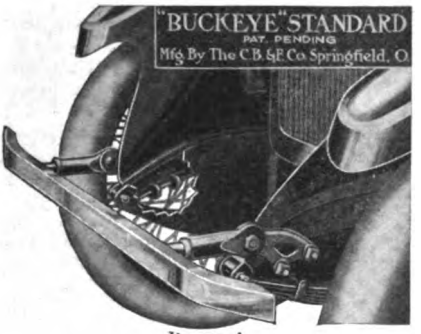
"BUCKEYE" BUMPERS



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The above illustrates our *"Buckeye Standard" Bumper* particularly adapted to cars which have "Splash-Aprons" extending to the end of the car frame.

Our "Buckeye Standard" Bumper will take care of any car with the following exceptions: "Franklin," "Ford," "Chevrolet," "Saxon," "Briscoe," "Jackson," "Scripps-Booth" and "Apperson."

(*We have Special Bumpers for these eight cars.*)

Our new Catalog No. 12 for 1918 describes our complete line of Universal as well as *SPECIAL "BUCKEYE" BUMPERS* for both the front and rear.

We can also furnish Special Front Bumpers for Light Trucks.

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THE CENTRAL BRASS & FIXTURE COMPANY

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Strongest and best Spring Bumper on the market. The only accessory of this nature that actually improves the appearance of the car

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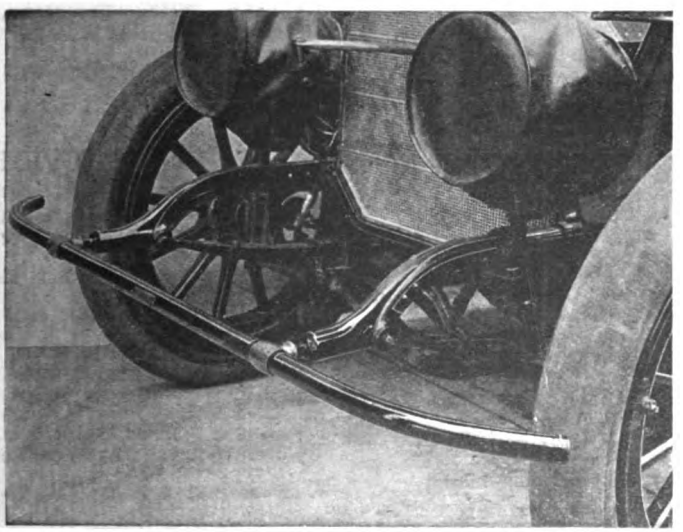
Protects Radiators and Lamps



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BUSHINGS, Bronze, for Fords

Apco Mfg. Co.. Eddy St., Providence, R. I.
Crum-Wiley Mfg. Co., Peru, Ind.
Edelmann & Co., E., 341-63 E. Ohio St., Chicago, Ill.
Evergood—See Grossman Mfg. Corp.
Freeman Brass Works, 92 Bowery, New York, N. Y
Grossman Mfg. Corp., Emil, Bush Terminal Bldg., No. 20, Brooklyn, N. Y. "Evergood."
Hill-Smith Metal Goods Co., Dept. H, Boston, Mass. (See page 221.)
Illinois Brass Mfg. Co., 226-30 W. Ontario St., Chicago, Ill.
Johnson Bronze Co., Mill St., New Castle, Pa.
Kelly Brass Works, 226 W. Ontario St., Chicago, Ill.
Metal Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.
Nelson Mfg. Co., A., 2700 Southport Ave., Chicago Ill.
Spencer Metal Products Co., Spencer, O.
Whitehouse-LeCompte Mfg. Co., 42-54 Elm St., Newark, N. J.

BUSHINGS, CORK—See Washers, Cork

BUSHINGS, GRAPHITE—See Bearings, Oilless

BUSHINGS, OILLESS—See Bearings, Oilless

BUSHINGS, Spark Plug Testing

(Steel bushing or shell threaded at one end to fit spark plug opening at the other to receive the plug and containing a glass cylinder through which the operation of the plug may be observed)

Detroit Accessories Corp., Detroit, Mich. (See page 533.)

BUSHINGS, Starter or Primer Attaching

(For use on motors not equipped with pet cocks)

A. & G. Mfg. Co., West Newton, Mass.
Stryker, C. W., 240 Shonnard St., Syracuse, N. Y.

BUTTON MACHINES—See Machines, Upholstery Button

BUTTONS, HORN—See Buttons, Push

BUTTONS, Push

(Special Push Buttons for use with Electric Horns. See also Horns, Electric)

Benjamin Electric Mfg. Co., Chicago, Ill. "Pushwell," "Tip Top." (See page 139.)
Garford Mfg. Co., Elyria, O.
Pushwell—See Benjamin Electric Mfg. Co.
Rosco—See Rosen & Co.
Rosen & Co., A. W., 610-14 Broadway, New York, N. Y. "Rosco."
Tip Top—See Benjamin Electric Mfg. Co.

BUTTONS, Special Horn, for Fords

(Designed for attachment to steering wheel or column to put horn control in a more accessible position)

Aerofram Co., 107 Massachusetts Ave., Boston, Mass. "Nu-Way."
Apco Mfg. Co., Eddy St., Providence, R. I.
Bulzi-Nut Mfg. Co., Kansas City, Mo.
Francis-Rand Co., Erie Bldg., Cleveland, O. "Handy."
Handy—See Francis-Rand Co.
Nu-Way—See Aerofram Co.
Redee Mfg. Corp., Minneapolis, Minn.
Seng Auto Device Co., 1305 Michigan Blvd., Chicago, Ill.

BUTTONS, Upholstery

Atlas Tack Co., Fairhaven, Mass.
Auto-Vehicle Parts Co., Colerain & Monmouth Aves., Cincinnati, O.
Brewer-Tichener Corp., 115 Port Watson St., Cortland, N. Y.
Higgin Mfg. Co., Newport, Ky.
Landers Bros. Co., Blucher & Buckingham Sts., Toledo, O.
Lounsbery & Sons, G. H., 107-09 W. Third St., Cincinnati, O.
Milonite—See Morley Mfg. Co.
Morley Mfg. Co., 120 Boylston St., Boston, Mass. "Milonite."
Neider Co., F. A., Augusta, Ky.
New Haven Button Co., 161 Brewery St., New Haven, Conn.
Reade, Chas. W., 346 Sherman Ave., New Haven, Conn.
Tockwotton Co., 79 S. Main St., Providence, R. I.
United Button Co., Union St., Easthampton, Mass.
White Co., L. C., 214 Bank St., Waterbury, Conn.

CABINET LOCKS—See Locks, Cabinet and Pad

CABINETS, FIRST AID—See Cases, Medical Emergency

CABLE, IGNITION—See Wire, Insulated

CABLE, WIRE—See Rope, Bronze Wire; also Rope, Steel Wire

CALCIUM CARBIDE—See Carbide, Calcium.

CALIPERS and DIVIDERS

(For Micrometer Calipers—See Micrometers)

A. M. C.—See Athol Machine Co.
Almond Mfg. Co., T. R., 1 Maple Ave., Ashburnham, Mass.
Athol Machine Co., Athol, Mass. "Premier," "A. M. C."
Brown & Sharpe Mfg. Co., Promenade St., Providence, R. I.
Columbia—See Smith, E. G.
Copelands—See Eagan, Thos. F.
Eagan, Thos. F., 8 Blithwood Ave., Worcester, Mass. "Copelands."
Fay—See Starrett Co.
Goodell-Pratt Co., Greenfield, Mass. (See page 751.)
Lowentraut Mfg. Co., P., 36-54 Brenner St., Newark, N. J.
Peck, Stow & Wilcox Co., Southington, Conn. "Pexto."
Pexto—See Peck, Stow & Wilcox Co.
Premier—See Athol Machine Co.
Smith, E. G., 315 W. Park Ave., Tampa, Fla. "Columbia."

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A Perfect Curtain Fastener

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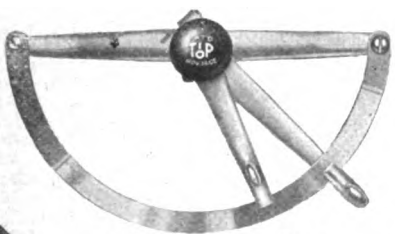

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CALIPERS and DIVIDERS (Cont'd)

Starrett Co., L. S., Athol, Mass. "Fay," "Yankee."
Union Tool Co., Orange, Mass.
Yankee—See Starrett Co.

CAM CUTTING MACHINES — See Machines, Cam Cutting

CAM-SHAFTS, Finished or Machined

(For Cam-Shafts in the rough—See Forgings, Drop)

Accuratime—See Muskegon Motor Specialties Co.
Commercial Machine Co., 31-33 W. Front St., Dunkirk, N. Y.
Gordon Mfg. Co., L. O., Muskegon, Mich. (See page 209.)
Jackson Motor Shaft Co., Jackson, Mich. (See page 141.)
Muskegon Motor Specialties Co., Muskegon, Mich. "Accuratime." (See page 143.)
Savage Arms Corp., Sharon, Pa. (See page 213.)
Wyman-Gordon Co., Worcester, Mass. (See Back Bone.)

CAM-SHAFTS, Special, for Fords

Green Engineering Co., Fourth & St. Clair Sts., Dayton, O.
Noonan, D. R., 220 W. Washington St., Paris, Ill.

CAMERAS, Aircraft

Brock, Jr., Arthur, 131 S. Fourth St., Philadelphia, Pa.
Herbert & Heusgen Co., 18 E. 42d St., New York, N. Y.

CAMP OUTFITS — See Hampers; also Stoves, Camp; also Tents

CAMP STOVES—See Stoves, Camp

CAN HOLDERS—See Holders or Tippers, Oil Can

CAN TIPPERS—See Holders or Tippers, Oil Can

CANOPIES, AUTOMOBILE—See Tops, Automobile

CANS, GASOLINE

(For Garage Use)

American Can Co., 120 Broadway, New York, N. Y. "Canco."
Atlantic Stamping Co., 180 Ames St., Rochester, N. Y.
Canco—See American Can Co.
Central Stamping Co., 172-74 Fulton St., New York, N. Y.
Delphos Mfg. Co., 100-24 S. Pierce St., Delphos, O.
Dover Stamping & Mfg. Co., 385 Putnam Ave., Cambridge, Mass.
Justrite Mfg. Co., 2061-81 Southport Ave., Chicago, Ill.
National Enameling & Stamping Co., 413 Fifth Ave., New York, N. Y.
Rochester Can Co., 103-09 Hague St., Rochester, N. Y.
Sexton Can Co., 228 Franklin St., Boston, Mass.
Vogel & Bros., Wm., 433 Kent Ave., Brooklyn, N. Y.

CANS, Oiling

(For Oil Guns—See Guns, Oil)

American Tube & Stamping Co., 471 Hancock Ave., Bridgeport, Conn.
Cannon Oiler Co., Keithsburg, Ill.
Delphos Mfg. Co., 100-24 S. Pierce St., Delphos, O.
Dover Stamping & Mfg. Co., 385 Putnam Ave., Cambridge, Mass.
Eagle Glass & Mfg. Co., Wellsburg, W. Va.
Gem Mfg. Co., Goebel & Fulton Sts., Pittsburgh, Pa.
Hero Mfg. Co., Gaul & Adams Sts., Philadelphia, Pa.
Noera Mfg. Co., 21-97 Griggs St., Waterbury, Conn.
Vogel & Bros., Wm., 433 Kent Ave., Brooklyn, N. Y.
Wall Mfg. Supply Co., P., 720 Preble Ave., Pittsburgh, Pa.
Walters Mfg. Co., Fulton Bldg., Pittsburgh, Pa.
Will Mfg. Co., 224 N. Desplaines St., Chicago, Ill.

CANS, Waste

(Receptacles for oily and dirty waste)

Acme Sheet Metal & Mfg. Co., 2343 Lakeside Ave., Cleveland, O.
Atlantic Stamping Co., 180 Ames St., Rochester, N. Y.
Auto Metal Co., 531 Worthington St., Springfield, Mass.
Central Stamping Co., 172-74 Fulton St., New York, N. Y.
Clark Co., W. J., 190 Depot St., Salem, O.
Cleveland Wire Spring Co., Cleveland, O.
Delphos Mfg. Co., 100-24 S. Pierce St., Delphos, O.
Diamond State Fibre Co., Bridgeport, Pa.
Dover Stamping & Mfg. Co., 385 Putnam Ave., Cambridge, Mass.
Durlach, I., 199-201 Wooster St., New York, N. Y.
Gem Stamped Steel Co. (Chelsea Sta.), Boston, Mass.
Justrite Mfg. Co., 2061-81 Southport Ave., Chicago, Ill.
Koven & Bro., L. O., Jersey City, N. J.
Kraft, A. C., 323-25 W. Lake St., Chicago, Ill. "Nacefas."
Lawson Co., F. H., Dept. D, Cincinnati, O. (See page 663.)
Nacefas—See Kraft, A. C.
Rochester Can Co., 103-09 Hague St., Rochester, N. Y.
Wall Mfg. Supply Co., P., 720 Preble Ave., Pittsburgh, Pa.
Walters Mfg. Co., Fulton Bldg., Pittsburgh, Pa.

CANVAS BUCKETS—See Buckets, Collapsible

CANVAS SHIPPING COVERS—See Covers, Paper and Canvas Shipping

CAP SCREWS—See Screws, Cap

CAPE CHISELS—See Chisels, Cold and Cape

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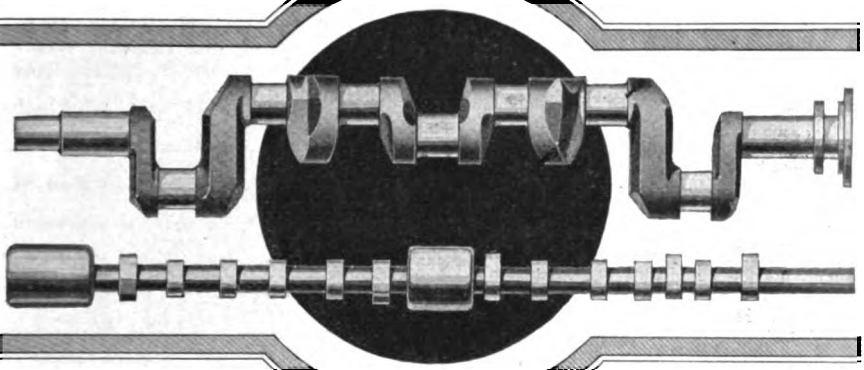

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CAPE TOPS—See Tops, Automobile

CAPS, BRASS—See Caps, Brass Radiator and Tank

CAPS, COMPOSITION RADIATOR—See Caps, Rubber or Composition Radiator

CAPS, Gasoline Tank, for Fords

(Including both standard and special caps)

Freeman Brass Works, 92 Bowery, New York, N. Y.

Illinois Brass Mfg. Co., 226-30 W. Ontario St., Chicago, Ill.

CAPS, Hub

(Pressed or Stamped Caps; for Cast Caps—See Castings)

Auld Co., D. L., 195-97 Long St., E., Columbus, O. (See page 781.)

Bossert Corp., Utica, N. Y. (See page 363.)

Bridgeport Brass Co., E. Main St., Bridgeport, Conn.

Buffalo Pressed Steel Co., Buffalo, N. Y. (See page 473.)

Crosby Co., Buffalo, N. Y. (See page 669.)

Gier Pressed Steel Co., Lansing, Mich. (See page 505.)

Hartford Machine Screw Co., Hartford, Conn. (See page 513.)

Ireland & Matthews Mfg. Co., Beard & Chatfield Sts., Detroit, Mich.

Konigslow Mfg. Co., Otto E., 3701 Perkins Ave., Cleveland, O.

Lindholm Metal Stamping Co., 107-15 Erie St., Camden, N. J. (See page 351.)

Worcester Pressed Steel Co., Worcester, Mass.

CAPS, Hub, for Fords

(Including both standard and special caps)

Bowen Products Corp., Auburn Division, Auburn, N. Y. "Empress." (See page 237.)

Edelmann & Co., E., 341-63 E. Ohio St., Chicago, Ill.

Empress—See Bowen Products Corp.

Eureka Parts Co., 328 Central Ave., Dunkirk, N. Y.

Evergood—See Grossman Mfg. Corp.

Field Mfg. Co., Owosso, Mich.

Freeman Brass Works, 92 Bowery, New York, N. Y.

Greer, Fredric, 525 W. Van Buren St. Chicago, Ill.

Grossman Mfg. Corp., Emil, Bush Terminal Bldg. No. 20, Brooklyn, N. Y. "Evergood."

Hill-Smith Metal Goods Co., Dept. H, Boston, Mass. (See page 221.)

Humboldt Machine & Stamping Co., 81-85 Tenth St., Long Island City, N. Y.

Metal Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

Michigan Auto Products Co., Detroit, Mich. "Ospeco." (See page 605.)

Nelson Mfg. Co., A., 2700 Southport Ave., Chicago, Ill.

Ospeco—See Michigan Auto Products Co.

Pfau Mfg. Co., Cincinnati, O.

Sager Co., J. H., 36-38 S. Water St., Rochester, N. Y.

Starr Bros., East Hampton, Conn.

Whitehouse-LeCompte Mfg. Co., 42-54 Elm St., Newark, N. J.

CAPS, Motorists

(See also Clothing, Motorists)

Bishop Co., J. H., Wyandotte, Mich.

Bradley Knitting Co., Delevan, Wis.

Demmerle & Co., 116 E. 23d St., New York, N. Y.

Dinner Co., Isaac H., 694 Washington St., Boston, Mass.

Favorite Knitting Mills, 1388 W. Sixth St., Cleveland, O.

Forman & Co., E., 578 Washington St., Boston, Mass.

Freeman, David, 226 W. Van Buren St., Chicago, Ill.

Gilbert Mfg. Co., 70-80 Center St., New Haven, Conn.

Hendrickson Hat Co., A. P., 127-29 S. Meridian St., Indianapolis, Ind.

Kaplan, Frank, & Dunn, 113-15 University Pl., New York, N. Y.

Lasky & Levy, 894 Broadway, New York, N. Y.

Patrick & Co., F. A., Duluth, Minn.

Pontiac Knitting Co., Pontiac, Mich.

Revillon Freres, 19 W. 34th St., New York, N. Y.

Spear & Co., Woodhaven, N. Y.

CAPS, Brass Radiator and Tank

Atwood Brass Works, Grand Rapids, Mich. (See page 531.)

Auto Ball Cock Co., Hazleton, Pa.

Bush Mfg. Co., Hartford, Conn. (See page 573.)

Imperial Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill. (See page 733.)

Scovill Mfg. Co., Waterbury, Conn. (See page 659.)

Western Brass Mfg. Works, Marshall Blvd., 21st St. & C., B. & Q. R. R., Chicago, Ill.

CAPS, Radiator, for Fords

(Including both standard and special caps)

Attwood Brass Works, Grand Rapids, Mich. (See page 531.)

Auto Ball Cock Co., Hazleton, Pa.

Bergwald Mfg. Co., 21-33 E. Fourth St., New York, N. Y.

Bowen Products Corp., Auburn Division, Auburn, N. Y. "Empress." (See page 237.)

Corcoran Mfg. Co., 4634 Spring Grove Ave., Cincinnati, O.

Crum-Wiley Mfg. Co., Peru, Ind.

Edelmann & Co., E., 341-63 E. Ohio St., Chicago, Ill.

Empress—See Bowen Products Corp.

Eureka Parts Co., 328 Central Ave., Dunkirk, N. Y.

Evergood—See Grossman Mfg. Corp.

Ezyfill—See Walker Mfg. Co.

Freeman Brass Works, 92 Bowery, New York, N. Y.

Goodrich-Lenhart Mfg. Co., 429 Widener Bldg., Philadelphia, Pa. (See page 111.)

Greer, Fredric, 525 W. Van Buren St., Chicago, Ill.

Grossman Mfg. Corp., Emil, Bush Terminal Bldg. No. 20, Brooklyn, N. Y. "Evergood."

Halladay Co., L. P., 501 N. Monroe St., Streator, Ill.

Home Light Co., 3351 Milwaukee Ave., Chicago, Ill.

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CAPS, Radiator, for Fords (Cont'd)

Illinois Brass Mfg. Co., 226-30 W. Ontario St., Chicago, Ill.

King—See Palmyra Mfg. Co.

Metal Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

Nelson Mfg. Co., A., 2700 Southport Ave., Chicago, Ill.

Palmyra Mfg. Co., Palmyra, Pa. "King."

Pfau Mfg. Co., Cincinnati, O.

Service Mfg. Co., 211-13 Center St., New York, N. Y. (See page 529.)

Walker Mfg. Co., Hamilton & Michigan Sts., Racine, Wis. "Ezyfill."

Western Brass Mfg. Works, Marshall Blvd., 21st St. & C. B. & Q. R. R., Chicago, Ill.

Whitehouse-LeCompte Mfg. Co., 42-54 Elm St., Newark, N. J.

CAPS, Rubber or Composition Radiator

American Hard Rubber Co., 9 Mercer St., New York, N. Y.

Bridgeport Brass Co., E. Main St., Bridgeport, Conn.

Continental Rubber Works, 1902 Liberty St., Erie, Pa. "Vitalic."

Crosby Co., Buffalo, N. Y. (See page 669.)

General Insulate Co., 1008-14 Atlantic Ave., Brooklyn, N. Y.

Luzerne Rubber Co., Trenton, N. J.

Mechanical Rubber Co., C. & P. & Nickel Plate R. R., Cleveland, O.

Niagara Insul-Bake Specialty Co., Bath St. & Whirlpool Ave., Niagara Falls, N. Y.

Pouvailsmith Corp., Poughkeepsie, N. Y. "Povasco."

Povasco—See Pouvailsmith Corp.

Stokes Rubber Co., Jos., Trenton, N. J.

Vitalic—See Continental Rubber Works.

CAPS, TANK—See Caps, Brass Radiator

CAPS, TANK, FOR FORDS—See Caps, Gasoline Tank

CAPS, Timer, for Fords

(Composition caps for replacing regular caps)

Niagara Insul-Bake Specialty Co., Bath St. & Whirlpool Ave., Niagara Falls, N. Y. "Zenk."

Zenk—See Niagara Insul-Bake Specialty Co.

CAR BEDS—See Beds or Berths, Car

CAR BERTHS—See Beds or Berths, Car

CAR LIGHTS—See Lights, Car Locator

CAR LOADERS—See Loaders, Truck

CAR LOCATOR LIGHTS—See Lights, Car Locator

CAR RAISING SKIDS—See Skids, Car Raising

CAR REPORTS—See Reports, Used Car Market

CAR SHIPPING BLOCKS—See Chocks, Blocks and Clamps, Car Shipping

CAR SHIPPING CHOCKS—See Chocks, Blocks and Clamps, Car Shipping

CAR SHIPPING CLAMPS—See Chocks, Blocks and Clamps, Car Shipping

CAR WASHING BRUSHES—See Washers, Vehicle

CAR WIRING CONDUITS—See Conduit, Flexible Car Wiring

CARBIDE, Calcium

American Carbolite Sales Co., 301 S. 55th Ave., W., Duluth, Minn. "Carbolite."

Carbolite—See American Carbolite Sales Co.

Union Carbide Sales Co., 122 S. Michigan Blvd., Chicago, Ill.

CARBON BURNING OUTFITS—See Machines, Motor Decarbonizing

CARBON REMOVERS — See Compounds, Carbon; also Machines, Motor Decorbonizing; also Removers, Carbon; also, Moisteners, Air or Mixture

CARBON REMOVING COMPOUNDS—See Compounds, Carbon Removing

CARBON REMOVING MACHINES — See Machines, Motor Decarbonizing

CARBON SCRAPERS—See Scrapers, Carbon

CARBONIA FINISH—See Treating, Heat

CARBORUNDUM PAPER — See Paper, Emery and Sand

CARBORUNDUM WHEELS—See Wheels, Grinding

CARBURETER CONTROLS—See Controls, Dash and Steering Column Carbureter

CARBURETER FLOATS—See Floats

CARBURETER INTAKE STRAINERS—See Cleaners, Air

CARBURETER REGULATORS FOR FORDS—See Regulators, Thermostatic Carbureter

CARBURETERS, Aircraft Gasoline

Aeronautical Equipment, 1 Wall St., New York, N. Y. (Importers.) "Clauden."

Byrne, Kingston & Co., 1415 Webster St., Kokomo, Ind. "Kingston."

Camden-Anchor Rockland Machine Co., Camden, Me. "Knox."

Clauden—See Aeronautical Equipment.

Findeisen & Kropf Mfg. Co., 21st & Rockwell Sts., Chicago, Ill. "Rayfield." (See page 147.)

Flechter & Co., L. V., 198 Jackson Ave., Long Island City, N. Y. (See page 147.)

Kingston—See Byrne, Kingston & Co.

Knox—See Camden-Anchor Rockland Machine Co.

Marvel Carbureter Co., Flint, Mich. (See pages 149 and 151.)

Master Carburetor Corp., 1523 Fort St. E., Detroit, Mich.

Miller Mfg. Co., Harry A., 219 E. Washington St., Los Angeles, Cal.

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Hundreds *of* Thousands *in* Use

The importance of a perfected carburetor of utmost simplicity, and of proven superiority is fully appreciated by automotive engineers.

Their verdict after exhaustive tests, is overwhelmingly in favor of the Tillotson, hundreds of thousands of which are rendering the height of satisfactory service.

One big Tillotson advantage is—

The air valve itself forms the restricted passage for the air passing through the carburetor and it consists merely of two flexible, easily yielding steel reeds, which open and close in proportion to the throttle opening.

Strictly automatic in its action, this air valve provides that at all engine speeds the highest air velocity in the carburetor is at the fuel supply nozzle.

The Tillotson Manufacturing Company, Toledo, Ohio

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CARBURETERS, Aircraft Gasoline (Continued)

Rayfield—See Findeisen & Kropf Mfg. Co.

Schebler — See Wheeler-Schebler Carbureter Co.

Stromberg Motor Devices Co., Dept. 1020, 64 E. 25th St., Chicago, Ill. (See page 151.)

Sunderman Corp., 23 Chambers St., Newburgh, N. Y. (See page 151.)

Webber Mfg. Co., 66-68 Stanhope St., Boston, Mass.

Wheeler-Schebler Carbureter Co., Indianapolis, Ind. "Schebler." (See page 147.)

Zenith Carbureter Co., Detroit, Mich. (See page 149.)

CARBURETERS, Gasoline

(For Mixing Valves or Vaporizers—See Vaporizers)

Air-Friction Carbureter Co., 1777 Broadway, New York, N. Y. (New York and New Jersey Distributors for Air Friction Carburetors.) (See page 149.)

Air-Friction Carburetor Co., First & Madison Sts., Dayton, O.

Ball Spray—See Shain, Chas. D.

Ball & Ball—See Penberthy Injector Co.

Bennett—See Wilcox-Bennett Carburetter Co.

Branford—See Malleable Iron Fittings Co.

Breeze Mfg. Co., 250-52 South St., Newark, N. J.

Browne—See Holt-Welles Co.

Browne-Branford—See Holt-Welles Co.

Byrne, Kingston & Co., 1415 Webster St., Kokomo, Ind. "Kingston."

Camden Anchor-Rockland Machine Co., Camden, Me. "Knox."

Carter Carburetor Co., 2838-40 N. Spring Ave., St. Louis, Mo.

Central Brass Mfg. Co., Cleveland, O. "Reedy."

D. K. W.—See Duquesne Auto Accessory Co.

Daley, Walter A., 3520 Melrose St., Chicago, Ill.

Dave Buick—See Jackson Carburetor Co.

Detroit Lubricator Co., Trumbull & Grand Trunk R. R., Detroit, Mich. "Stewart."

Duquesne Auto Accessory Co., New Kensington, Pa. "D. K. W."

Ensign Carburetor Co., Los Angeles, Cal.

Ess-Ess—See Scott & Sons Co.

Federal Brass Works, 362-74 Trombley Ave., Detroit, Mich. "Zephyr."

Findeisen & Kropf Mfg. Co., 21st & Rockwell Sts., Chicago, Ill. "Rayfield." (See page 147.)

Flechter & Co., L. V., 198 Jackson Ave., Long Island City, N. Y. (See page 147.)

Fulton-Greuter Engineering Co., Sixth Ave. & Baymiller St., Cincinnati, O.

G. & A. Carburetor Co., 105-07 E. 12th St., New York, N. Y.

Gleason-Peters Air Pump Co., 384 Classon Ave., Brooklyn, N. Y. "Maco."

Gravity Carburetor Co., 3701 Perkins Ave., Cleveland, O.

Heath Carburetor Corp., Marquette Bldg., Detroit, Mich.

Heco—See Heinze Electric Co.

Heinze Electric Co., Lowell, Mass. "Heco."

Holley Kerosene Carburetor Co., 145-47 Willis Ave., E., Detroit, Mich.

Holt-Welles Co., 1790 Broadway, New York, N. Y. "Browne," "Browne Branford."

Holtzer-Cabot Electric Co., Roxbury, Mass. "Newcomb."

Hoyt Carburetor & Automobile Co., 45 Union Ave., Boston, Mass.

Inverted Jet Carburetor Co., 611-15 Fort St., W., Detroit, Mich. (See page 179.)

Jackson Carburetor Co., Detroit & Columbus Sts., Jackson, Mich. "Dave Buick."

Johnson Co., 280 Harper Ave., Detroit, Mich. (See page 529.)

Juhasz Carburetor Co., 244 W. 49th St., New York, N. Y.

Justrite—See Wilcke-Armstrong Co.

K. D. Carbureter Co., Marquette & Hamilton Sts., Cleveland, O.

Kerosene Burning Carburetor Co., 1251 Michigan Ave., Chicago, Ill.

Kemp, J. P., 418 Evesham Ave., Baltimore, Md.

Kingston—See Bryne, Kingston & Co.

Knox—See Camden Anchor-Rockland Machine Co.

Lacharnay Carburetor Co., Fifth Ave. & Boulevard, Paterson, N. J.

Light Mfg. & Foundry Co., Pottstown, Pa. "Parkin."

M. T.—See Sunderman Corp.

Maco—See Gleason-Peters Air Pump Co.

Malleable Iron Fitings Co., Branford, Conn. "Branford."

Manning Carbureter Co., 24 N. Franklin St., Janesville, Wis.

Marvel Carbureter Co., Flint, Mich. (See pages 149 and 151.)

Master Carburetor Corp., 1523 Fort St. E., Detroit, Mich.

Mayer Carburetor Co., 2673 Main St., Buffalo, N. Y.

Miller Mfg. Co., Harry A., 219 E. Washington St., Los Angeles, Cal.

My-Cue Engineering & Machine Works, Niagara Falls, N. Y.

National Auto Accessory Co., Salem Depot, N. H.

National Equipment Co., 128 S. Racine Ave., Chicago, Ill. "Tom Thumb." (See page 149.)

New Speed Carburetor Co., 1657 Van Ness Ave., San Francisco, Cal.

Newcomb—See Holtzer-Cabot Electric Co.

Parkin—See Light Mfg. & Foundry Co.

Penberthy Injector Co., Detroit, Mich. "Ball & Ball."

Rayfield—See Findeisen & Kropf Mfg. Co.

Reedy—See Central Brass Mfg. Co.

Reid Appliance Co., Harrison St. & Grand River Ave., Detroit, Mich.

Russell Eureka Carburetor Co., Rudd, Ia.

Schebler—See Wheeler-Schebler Carburetor Co.

Scott & Sons Co., Medford, Mass. "Ess-Ess."

Shain, Chas. D., Brooklyn, N. Y. "Ball Spray."

Shakespeare Co., Kalamazoo, Mich.

Stewart—See Detroit Lubricator Co.

Stewart Machine Works, Alfred C., Tenth & Santee Sts., Los Angeles, Cal.

Stromberg Motor Devices Co., Dept. 1020, 64 E. 25th St., Chicago, Ill. (See page 151.)

Sunderman Corp., 23 Chambers St., Newburgh, N. Y. "M. T." (See page 151.)

Tillotson Mfg. Co., Toledo, O. (See page 145.)

Tom Thumb—See National Equipment Co.

Van Briggle Motor Device Co., 427 N. Capitol Ave., Indianapolis, Ind.

Webber Mfg. Co., 66-68 Stanhope St., Boston, Mass.

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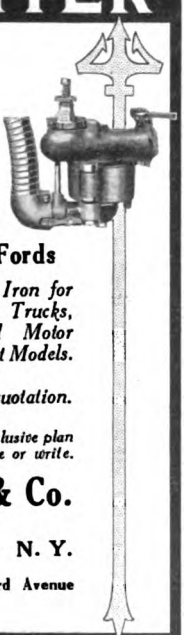

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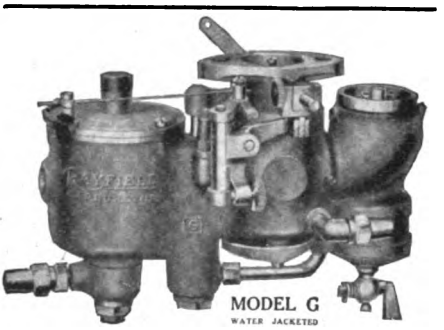
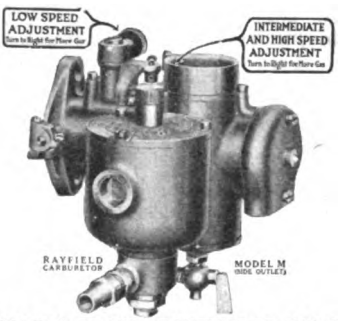
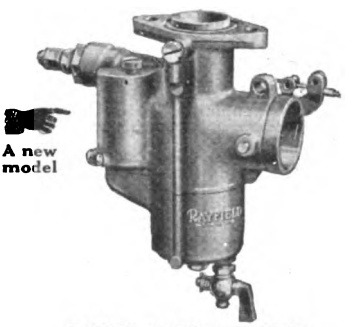


MODEL G FOR PASSENGER CARS



MODEL M FOR PASSENGER CARS



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FINDEISEN & KROPF MFG. CO.

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RAYFIELD CARBURETOR

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CARBURETERS, Gasoline (Continued)

Wheeler-Schebler Carburetor Co., Indianapolis, Ind. "Schebler." (See page 147.)

Wilcox-Bennett Carburetter Co., 1030 Marshall St., N. E., Minneapolis, Minn. "Bennett."

Wilcke-Armstrong Co., 182 Beaubien St., Detroit, Mich. "Justrite."

Zenith Carburetor Co., Detroit, Mich. (See page 149.)

Zephyr—See Federal Brass Works.

CARBURETERS, Gasoline, for Fords

Air-Friction Carburetor Co., 1777 Broadway, New York, N. Y. (New York and New Jersey Distributors for Air Friction Carburetors.) (See page 149.)

Air Friction Carburetor Co., First & Madison Sts., Dayton, O.

Ball-Spray—See Shain, Chas. D.

Breeze Mfg. Co., 250-52 South St., Newark, N. J.

Browne-Branford—See Holt-Welles Co.

Byrne, Kingston & Co., 1415 Webster St., Kokomo, Ind. "Kingston."

Camden Anchor-Rockland Machine Co., Camden, Me. "Knox."

Carter Carburetor Co., 2838-40 N. Spring Ave., St. Louis, Mo.

D. & B.—See Harrington Co.

Detroit Lubricator Co., Trumbull & Grand Trunk R. R., Detroit, Mich. "Stewart."

Duntley—See Little Giant Truck Co.

Findeisen & Kropf Mfg. Co., 21st & Rockwell Sts., Chicago, Ill. "Rayfield." (See page 147.)

Flechter & Co., L. V., 198 Jackson Ave., Long Island City, N. Y. "Trident." (See page 147.)

Gardner Carburetor & Brass Works, 201 Summit Ave., Detroit, Mich.

Gleason-Peters Air Pump Co., 384 Classon Ave., Brooklyn, N. Y. "Maco."

Gravity Carburetor Co., 3701 Perkins Ave, Cleveland, O.

Griffin Carburetor Co., United Bank Bldg., Paterson, N. J.

Harrington Co., O. C., 341 N. Crawford Ave., Chicago, Ill. "D. & B."

Heco—See Heinze Electric Co.

Heinze Electric Co., Lowell, Mass. "Heco."

Holt-Welles Co., 1790 Broadway, New York, N. Y. "Browne-Branford."

Johnson Co., 280 Harper Ave., Detroit, Mich. (See page 529.)

Justrite—See Wilcke-Armstrong Co.

R. B. C.—See Kerosene Burning Carburetor Co.

Kerosene Burning Carburetor Co., 1251 Michigan Ave., Chicago, Ill.

Kingston—See Byrne, Kingston & Co.

Knox—See Camden Anchor-Rockland Machine Co.

Liberty Carburetor Co., Dix & Vinewood Aves., Detroit, Mich. (See page 249.)

Little Giant Truck Co., Little Giant Bldg., Chicago, Ill. "Duntley."

M. T.—See Sunderman Corp.

Maco—See Gleason-Peters Air Pump Co.

Marvel Carbureter Co., Flint, Mich. (See pages 149 and 151.)

Master Carburetor Corp., 1523 Fort St. E., Detroit, Mich.

Mayer Carbureter Co., 2673 Main St., Buffalo, N. Y.

Miller Mfg. Co., Harry A., 219 E. Washington St., Los Angeles, Cal.

National Equipment Co., 128 S. Racine Ave., Chicago, Ill. "Tom Thumb, Jr." (See page 149.)

Rayfield—See Findeisen & Kropf Mfg. Co.

Schebler—See Wheeler-Schebler Carbureter Co.

Shain, Chas. D., Brooklyn, N. Y. "Ball-Spray."

Stewart—See Detroit Lubricator Co.

Stromberg Motor Devices Co., Dept. 1020, 64 E. 25th St., Chicago, Ill. (See page 151.)

Sunderman Corp., 23 Chambers St., Newburgh, N. Y. "M. T." (See page 151.)

Tom Thumb, Jr.—See National Equipment Co.

Trident—See Flechter & Co.

U. & J. Carburetor Co., 507 W. Jackson Blvd., Chicago, Ill.

Van Briggle Motor Device Co., 427 N. Capitol Ave., Indianapolis, Ind.

Webber Mfg. Co., 66-68 Stanhope St., Boston, Mass.

Wheeler-Schebler Carburetor Co., Indianapolis, Ind. "Schebler." (See page 147.)

Wilcke-Armstrong Co., 182 Beaulien St., Detroit, Mich. "Justite."

Zenith Carbureter Co., Detroit, Mich. (See page 149.)

CARBURETERS, Kerosene

Bennett—See Wilcox-Bennett Carburetter Co.

Breeze Mfg. Co., 250-52 South St., Newark, N. J.

Camden Anchor-Rockland Machine Co., Camden, Me. "Knox."

Conservation Carburetor Co., 600 E. Walnut St., Des Moines, Ia.

Dual Carburetor & Mfg. Co., Superior Ave. & E. 40th St., Cleveland, O.

Good Inventions Co., 271 37th St., Brooklyn, N. Y.

Harroun—See Invincible Mfg. Co.

Holley Kerosene Carburetor Co., 145-47 Willis Ave., E., Detroit, Mich.

Invincible Mfg. Co., Pittsburgh, Pa. "Harroun."

K. B. C.—See Kerosene Burning Carburetor Co.

Kerosene Burning Carburetor Co., 1251 Michigan Ave., Chicago, Ill. "K. B. C."

Kero Karburetor—See Western Carburetor Co.

Knox—See Camden Anchor-Rockland Machine Co.

National Equipment Co., 128 S. Racine Ave., Chicago, Ill. "Tom Thumb." (See page 149.)

Reid Appliance Co., Harrison St. & Grand River Ave., Detroit, Mich.

Russell Eureka Carburetor Co., Rudd, Ia.

Stromberg Motor Devices Co., Dept. 1020, 64 E. 25th St., Chicago, Ill. (See page 151.)

Tillotson Mfg. Co., Toledo, O. (See page 145.)

Tom Thumb—See National Equipment Co.

Trader & Co., R. V., 314 Atlantic Ave., McKeesport, Pa.

Turner Brass Works, Sycamore, Ill.

Western Carburetor Co., Alma, Mich. "Kero Karburetor."

Wilcox-Bennett Carburetter Co., 1030 Marshall St., N. E., Minneapolis, Minn. "Bennett."

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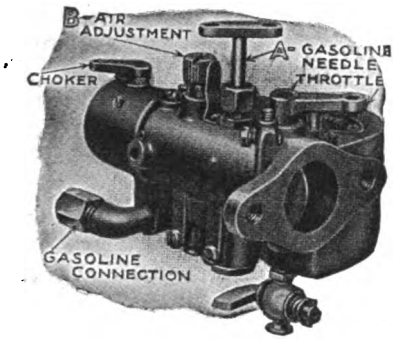
Designed especially to fit right in place of regular Ford installation. No changes whatsoever necessary.



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Simple attachment permits use of kerosene or gasoline with equal facility, without changing adjustment.

Write for complete details.

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KNOWN the world over as the *zenith* of carburetor efficiency. A long list of American builders of cars, trucks and aeroplanes believe this simple, plain tube device to be the best insurance for permanent carburetor satisfaction.

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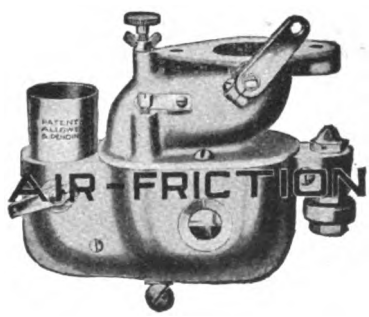

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Will burn ½ coal oil with cheapest gasoline. Write for 30 day trial offer and money back guarantee.

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CARBURETORS, Kerosene, for Fords

(For Fuel or Mixture Heaters—see Heaters, Mixture; for Special Jacketed Manifolds—See Manifolds, Special and Jacketed)

Frankfort Carburetor Co., Frankfort, Ind. (See page 151.)

Kero Karburetor—See Western Carburetor Co.

Kerosene Equipment Co., Kresge Bldg., Detroit, Mich.

Kerosene Motor Co., Jefferson Bldg., Peoria, Ill.

National Equipment Co., 128 S. Racine Ave., Chicago, Ill. "Tom Thumb, Jr." (See page 149.)

Tom Thumb, Jr.—See National Equipment Co.

Wabash Kerosene Carburetor Co., Wabash, Ind.

Western Carburetor Co., Alma, Mich. "Kero Karburetor."

CARBURETORS, Motor Boat Gasoline

(See also Valves, Generator)

Air-Friction Carburetor Co., 1777 Broadway, New York, N. Y. (New York and New Jersey Distributors for Air Friction Carburetors.) (See page 149.)

Air-Friction Carburetor Co., First & Madisc. Sts., Dayton, O.

Bennett—See Wilcox-Bennett Carburetter Co.

Byrne-Kingston & Co., 1415 Webster St. Kokomo, Ind. "Kingston."

Camden Anchor-Rockland Machine Co., Camden, Me. "Knox."

Carter Carburetor Co., 2838-40 N. Spring Ave St. Louis, Mo.

Findeisen & Kropf Mfg. Co., 21st & Rockwell Sts., Chicago, Ill. "Rayfield." (See page 147.)

Flechter & Co., L. V., 198 Jackson Ave., Long Island City, N. Y. (See page 147.)

Generator Valve Co., 47 Dinsmore Pl., Brooklyn, N. Y. "James-Acorn."

Holtzer-Cabot Electric Co., Roxbury, Mass.

James-Acorn—See Generator Valve Co.

K. D. Carburetor Co., Marquette & Hamilton Sts., Cleveland, O.

Kero Karburetor—See Western Carburetor Co.

Kingston—See Byrne, Kingston & Co.

Knox—See Camden Anchor-Rockland Machine Co.

Marvel Carbureter Co., Flint, Mich. (See pages 149 and 151.)

Master Carburetor Corp., 1523 Fort St., E. Detroit, Mich.

Miller Mfg. Co., Harry A., 219 E. Washington St., Los Angeles, Cal.

Monarch Valve Co., 112 Front St., Brooklyn, N. Y.

National Equipment Co., 128 S. Racine Ave., Chicago, Ill. "Tom Thumb." (See page 149.)

Rayfield—See Findeisen & Kropf Mfg. Co.

Schebler—See Wheeler-Schebler Carburetor Co.

Shakespeare Co., Kalamazoo, Mich.

Stromberg Motor Devices Co., Dept. 1020, 64 E. 25th St., Chicago, Ill. (See page 151.)

Sunderman Corp., 23 Chambers St., Newburgh, N. Y. (See page 151.)

Tom Thumb—See National Equipment Co.

Van Briggle Motor Device Co., 427 N. Capital Ave., Indianapolis, Ind.

Webber Mfg. Co., 66-68 Stanhope St., Boston, Mass.

Western Carburetor Co., Alma, Mich. "Kero-Karburetor."

Wheeler-Schebler Carburetor Co., Indianapolis, Ind. "Schebler." (See page 147.)

Wilcox-Bennett Carburetter Co., 1030 Marshall St., N. E., Minneapolis, Minn. "Bennett."

Zenith Carburetor Co., Detroit, Mich. (See page 149.)

CARBURETORS, Motor Boat Kerosene

Bennett—See Wilcox-Bennett Carburetter Co.

Camden Anchor-Rockland Machine Co., Camden, Me. "Knox."

Knox—See Camden Anchor-Rockland Machine Co.

National Equipment Co., 128 S. Racine Ave., Chicago, Ill. "Tom Thumb." (See page 149.)

Tom Thumb—See National Equipment Co.

Wilcox-Bennett Carburetter Co., 1030 Marshall St., N. E., Minneapolis, Minn. "Bennett."

CARBURETORS, Motorcycle Gasoline

Byrne-Kingston Co., 1415 Webster St., Kokomo, Ind. "Kingston."

Kingston—See Byrne-Kingston Co.

Master Carburetter Corp., 1523 Fort St., E. Detroit, Mich.

Schebler—See Wheeler-Schebler Carburetor Co.

Sunderman Corp., 23 Chambers St., Newburgh, N. Y. (See page 151.)

Wheeler-Schebler Carburetor Co., Indianapolis, Ind. "Schebler." (See page 147.)

Zenith Carburetor Co., Detroit, Mich. (See page 149.)

CARBURETORS, Tractor Gasoline

Bennett—See Wilcox-Bennett Carburetter Co.

Byrne-Kingston Co., 1415 Webster St., Kokomo, Ind. "Kingston."

Camden Anchor-Rockland Machine Co., Camden, Me. "Knox."

Carter Carburetor Co., 2838-40 N. Spring Ave., St. Louis, Mo.

Findeisen & Kropf Mfg. Co., 21st & Rockwell Sts., Chicago, Ill. "Rayfield." (See page 147.)

Gravity Carburetor Co., 3701 Perkins Ave., Cleveland, O.

Inverted Jet Carburetor Co., 611-15 Fort St. W., Detroit, Mich. See page 179.)

Kingston—See Byrne-Kingston Co.

Knox—See Camden Anchor-Rockland Machine Co.

Knox Motors Co., 53 Wilbraham Rd., Springfield, Mass.

Marvel Carbureter Co., Flint, Mich. (See pages 149 and 151.)

Master Carburetor Co., 1523 Fort St., E., Detroit, Mich.

Mayer Carburetor Co., 2673 Main St., Buffalo, N. Y.

Miller Mfg. Co., Harry A., 219 E. Washington St., Los Angeles, Cal.

Motsinger Device Mfg. Co., 26th & Ferry Sts., Lafayette, Ind.

National Equipment Co., 128 S. Racine Ave., Chicago, Ill. "Tom Thumb." (See page 149.)

Rayfield—See Findeisen & Kropf Mfg. Co.

Schebler—See Wheeler-Schebler Carburetor Co.

Shakespeare Co., Kalamazoo, Mich.

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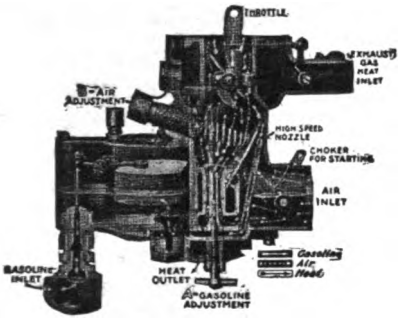

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VACUUM

Carburetor 7.50

Model F—Supreme for Fords, Metz and Saxon 4 — **F. O. B. Newburgh**

It will save you from 30 to 50% of gasoline in any motor—you can prove this yourself—50,000 owners have already received this saving; at the same time it will give **more power, greater speed, better acceleration, greater hill-climbing ability, a greater range of speeds, and flexibility undreamed of.**

A good, big profit for every dealer who handles it. Its popular price means quick sales.

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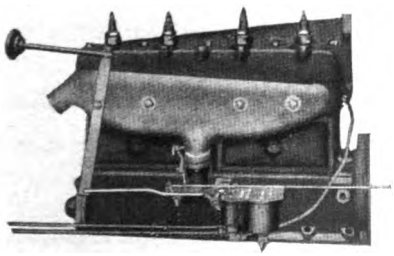
Frankfort Kerosene Carburetor

Solves the fuel problem—a kerosene and gasoline carburetor combined into one device.

This carburetor will run a motor on any grade of coal oil—naphtha or solor oil—and will utilize the lowest grade of gasoline.

Frankfort Carburetor Company
Frankfort, Indiana



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CARBURETORS, Tractor Gasoline (Continued)

Stromberg Motor Devices Co., Dept. 1020, 64 E. 25th St., Chicago, Ill. (See page 151.)

Sunderman Corp., 23 Chambers St., Newburgh, N. Y. (See page 151.)

Tom Thumb—See National Equipment Co.

Van Briggle Motor Device Co., 427 N. Capital Ave., Indianapolis, Ind.

Webber Mfg. Co., 66-68 Stanhope St., Boston, Mass.

Wheeler-Schebler Carburetor Co., Indianapolis, Ind. "Schebler." (See page 147.)

Wilcox-Bennett Carburetter Co., 1030 Marshall St., N. E., Minneapolis, Minn. "Bennett."

Zenith Carburetor Co., Detroit, Mich. (See page 149.)

CARBURETORS, Tractor Kerosene

Bennett—See Wilcox-Bennett Carburetter Co.

Camden Anchor-Rockland Machine Co., Camden, Me. "Knox."

Holley Kerosene Carburetor Co., 145-47 Willis Ave., E., Detroit, Mich.

K. B. C.—See Kerosene Burning Carburetor Co.

Kero-Karburetor—See Western Carburetor Co.

Kerosene Burning Carburetor Co., 1251 Michigan Ave., Chicago, Ill. "K. B. C."

Kerosene Equipment Co., Kresge Bldg., Detroit, Mich.

Knox—See Camden Anchor-Rockland Machine Co.

National Equipment Co., 128 S. Racine Ave., Chicago, Ill. "Tom Thumb." (See page 149.)

Tom Thumb—See National Equipment Co.

Western Carburetor Co., Alma, Mich. "Kero-Karburetor."

Wilcox-Bennett Carburetter Co., 1030 Marshall St., N. E., Minneapolis, Minn. "Bennett."

CARPET, Coach

(See also Trimmings, Cloth and Carpet)

Cochrane Mfg. Co., East Dedham, Mass.

Dobson, John & James, 809 Chestnut St., Philadelphia, Pa.

Dusenbury & Co., Louis, 229 Fourth Ave., New York, N. Y. (Sole Distributors for Magee Carpet Co., Bloomsburg, Pa.)

Highspire—See Sloane, W. & J.

Hirst-Roger Co., Philadelphia, Pa. (See page 153.)

McCleary, Wallin & Crouse, Amsterdam, N. Y.

Magee Carpet Co.—See Dusenbury & Co.

Masland & Sons—See Sloane, W. & J.

Schofield, Mason & Co., Fairhill, Reese & Cumberland Sts., Philadelphia, Pa.

Sloane, W. & J., 575 Fifth Ave., New York, N. Y. (Sole Distributors for C. H. Masland & Sons, Philadelphia, Pa. "Highspire." (See pages 393 and 417.)

CARPET BINDING—See Binding, Mat and Carpet

CARRIAGE BOLTS—See Bolts, Machine

CARRIERS, DEMOUNTABLE WHEEL FOR FORDS—See Holders or Carriers, Spare Wheel

CARRIERS, LUGGAGE—See Racks, Trunk; also Bags, Coat Rail; also Holders, Suit Case

CARRIERS, Motorcycle Luggage

Forsyth Metal Goods Co., East Aurora, N. Y.

CARRIERS, SPARE WHEEL FOR FORDS—See Holders or Carriers, Spare Wheel

CARRIERS, TIRE—See Holders, Tire.

CARRYING BAGS—See Bags, Water Carrying

CARS, Motorcycle Side and Fore

Excelsior Motor Mfg. & Supply Co., 3701 Cortland St., Chicago, Ill. "Henderson."

Henderson—See Excelsior Motor Mfg. & Supply Co.

National Dairy Machine Co., Goshen, Ind.

Rogers Mfg. Co., 337 W. Madison St., Chicago, Ill.

CARS, Motorcycle, Side and Rear

Cygnet Mfg. Co., 41 Perry St., Buffalo, N. Y.

CASE-HARDENING—See Treating, Heat

CASE-HARDENING COMPOUNDS — See Compounds, Case-Hardening

CASE-HARDENING FURNACES—See Furnaces, Annealing

CASE-HARDENING MATERIALS — See Compounds, Case-Hardening

CASES, ACCIDENT—See Cases, Medical Emergency

CASES, BATTERY—See Boxes, Battery

CASES, Bolt and Screw

American Bolt & Screw Case Co., Dayton, O.

Hobart Bros. Co., 113 Water St., Troy, N. Y.

CASES, BULB—See Cases, Extra Lamp Bulb

CASES, CARD—See Cases, Toilet

CASES, Curtain, for Fords

(Leather or fabric bags or cases for carrying top or storm curtains)

Atlas Specialty Mfg. Co., 16-22 E. 24th St., Chicago, Ill. (See page 123.)

Invincible—See Peters & Herron Dash Co.

Peters & Herron Dash Co., Gift St., Columbus, O. "Invincible."

CASES, EMERGENCY—See Cases, Medical Emergency

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CHAS. E. CHAPIN CO., Inc.

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CASES, Extra Lamp Bulb

(Cases or boxes for carrying spare lamp bulbs on car)

Auburn Leather Goods Co., 3 Miller St., Auburn, N. Y.

Campbell—See Perkins-Campbell Co.

Dover Stamping & Mfg. Co., 385 Putnam Ave., Cambridge, Mass.

Globe Machine & Stamping Co., 1250 W. 76th St., Cleveland, O.

J. & B. Mfg. Co., Pittsfield, Mass.

Perkins-Campbell Co., 634 Broadway, Cincinnati, O. "Campbell." (See page 227.)

Cases, Lamp—See Cases, Extra Lamp Bulb.

CASES, LUGGAGE, FOR FORDS — See Bags, Luggage

CASES, LUNCHEON—See Hampers, Touring

CASES, Medical Emergency

Accident Cabinet Co., Kalamazoo, Mich.

First Aid Equipment Co., 16 E. 23d St., New York, N. Y.

Patent Novelty Co., Fulton, Ill.

Sharp & Smith, 103 N. Wabash Ave., Chicago, Ill.

Wilford Hall Laboratories, Portchester, N. Y.

CASES, PLUG—See Cases, Spark Plug

CASES, SCREW—See Cases, Bolt and Screw

CASES, SPARK COIL—See Boxes, Spark Coil

CASES, Spark Plug

(Leather or Fabric cases for holding spare plugs)

Algco—See Auburn Leather Goods Co.

Atlas Specialty Mfg. Co., 16-22 E. 24th St., Chicago, Ill. (See page 123.)

Auburn Leather Goods Co., 3 Miller St., Auburn, N. Y. "Algco."

Campbell—See Perkins-Campbell Co.

Invincible—See Peters & Herron Dash Co.

Nathan Novelty Mfg. Co., 84-90 Reade St., New York, N. Y. (See page 153.)

Niagara Fabric Mfg. Co., 47 Greene St., New York, N. Y.

Perkins-Campbell Co., 634 Broadway, Cincinnati, O. "Campbell." (See page 227.)

Peters & Herron Dash Co., Gift St., Columbus, O. "Invincible."

CASES, Toilet and Card

(For limousines or other closed cars)

Art Work Shop, 411-49 Ellicott St., Buffalo, N. Y.

Cowles & Co., C., New Haven, Conn. (See page 339.)

Kraft & Sons, Theo., 458 W. Broadway, New York, N. Y.

O'Brien Mfg. Co., Joseph F., 391 Broadway, New York, N. Y.

Perpente Mfg. Co., State & Wall Sts., New Haven, Conn.

Rumpp & Sons, C. F., Fifth & Cherry Sts., Philadelphia, Pa.

Ruszits Fur Co., John, 7 E. 48th St., New York, N. Y.

Taylor Co., H. D., 101-05 Oak St., Buffalo, N. Y.

CASES, TOOL—See Bags, Tool; also Boxes, Tool

CASES, TUBE—See Cases, Tire and Tube

CAST IRON CEMENT—See Cement, Cast Iron

CAST STEEL WHEELS—See Wheels, Cast Steel

CASTINGS, Aluminum

Acieral Co. of America, 26 Cortlandt St., New York, N. Y. (See page 859.)

Adams & Westlake Co., Chicago, Ill. "Adlake." (See page 383.)

Adlake—See Adams & Westlake Co.

Alloy Foundry & Machine Corp., 73 Cedar St., New Rochelle, N. Y.

Allyne—See Aluminum Castings Co.

Aluminite—See Green Engineering Co.

Aluminum Castings Co., Cleveland, O. "Lynite." (See page 157.)

Aluminum Foundry Co., Bauch St., Sebring, O.

American Brass & Iron Co., Detroit, Mich. (See page 153.)

American Bronze Co., 90-108 Arthur St., Buffalo, N. Y.

American Foundry Co., 634 S. 11th St., Newark, N. J.

Amesbury Brass & Foundry Co., Amesbury, Mass.

Atlas Brass Foundry Co., Columbus, O. (See page 539.)

Blake, Edwin J., 565 Windsor St., Hartford, Conn.

Bohn Foundry Co., Chas. B., 738-66 Hart Ave., Detroit, Mich.

Brass & Bronze Castings Co., 6515 Carnegie Ave., S. E., Cleveland, O.

Buckeye Brass & Mfg. Co., 1807 Columbus Rd., Cleveland, O.

Buffalo Non-Ferrous Casting & Mfg. Co., 43 Letchworth St., Buffalo, N. Y.

Bunting Brass & Bronze Co., 737 Spencer St., Toledo, O. (See page 157.)

Champion Brass Works, 260 Division St., Coldwater, Mich.

City Brass Foundry Co., 5310 St. Clair Ave., N. E., Cleveland, O.

Clayton & Lambert Mfg. Co., Detroit, Mich. (See page 743.)

Cleveland Aluminum Casting Co., Addison Rd. & St. Clair Ave., Cleveland O.

Cochrane Brass Foundry Co., York, Pa.

Cramp & Sons Ship & Engine Bldg. Co., William, Philadelphia, Pa. (See page 453.)

D'Este Co., Julian, 26 Canal St., Boston, Mass.

Delaware Brass & Aluminum Co., 20th & Walnut Sts., Muncie, Ind.

Diamond Brass Foundry & Machine Co., 1115 Washington Blvd., Chicago, Ill.

Dorchester Brass & Aluminum Foundry, Old Sturtevant Bldg. (Jamaica Plain), Boston, Mass.

Electric Materials Co., North East, Pa.

Erie Specialty Co., 510 W. 12th St., Erie, Pa.

Essex Brass Foundry Co., Sixth & Harvard Sts., Cambridge, Mass.

Faries Mfg. Co., Decatur, Ill.

Fischer Sweeney Bronze Co., 13th & Grand Sts., Hoboken, N. J.

Fitz Water Wheel Co., Penn St. & Penna. R. R., Hanover, Pa.

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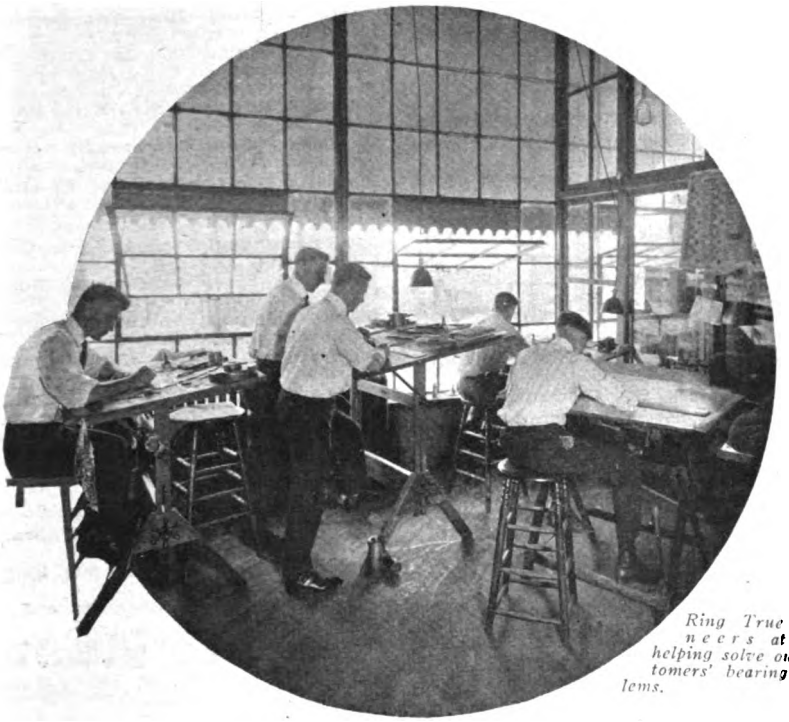

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Detroit, U. S. A.

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THE JEWELS OF A MOTOR
GENERAL ALUMINUM & BRASS MFG. CO.

The Mark of Ring True Bearings.

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CASTINGS, Aluminum (Continued)

General Aluminum & Brass Mfg. Co., Detroit, Mich. (See page 155.)

General Bronze Foundry Co., 4800 Hamilton Ave., Cleveland, O. "Werne."

General Castings Co., Ford Bldg., Detroit, Mich.

Germann Bronze Co., 355 W. 19th St., Erie, Pa.

Gerson-Carey Co., Kalamazoo St. & L. S. Ry., Lansing, Mich.

Graham & Co., James, 293 Wooster St., New Haven, Conn.

Green Engineering Co., Fourth & St. Clair Sts., Dayton, O. "Aluminite."

Griswold Mfg. Co., 1055 W. 12th St., Erie, Pa.

Hall Co., William, Quincy, Mass.

Harley Co., Springfield, Mass. (See page 185.)

Herculite—See Levett Co.

Hoboken Brass Co., Seventh & Madison Sts., Hoboken, N. J.

Hotz Foundry & Mfg. Co., Fremont, O.

Howard Metal Co., Second & Canal Sts., Reading Pa.

Ideal Bronze Co., Cleveland, O. (See page 451)

Imperial Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill. (See page 733.)

Indianapolis Brass Co., 1012 E. Michigan St., Indianapolis, Ind.

Industrial Foundry & Machine Co., Water St., Pottstown, Pa.

Jefferson Brass Foundry, 209 King St., Brooklyn, N. Y.

Johnson Bronze Co., Mill St., New Castle, Pa.

K & M Brass & Aluminum Castings Co., 10611-13 Quincy Ave., Cleveland, O.

Keyless Lock Co., 1401 Newman St., Indianapolis, Ind.

Kokomo Brass Works, 1415 Webster St., Kokomo, Ind.

Kramm Foundry Co., 1120-30 E. Georgia St., Indianapolis, Ind. "Maluminum." (See page 865.)

Lee Co., Wm. O., Port Huron, Mich.

Levering Bros., 210 Key Highway, Baltimore, Md.

Levettal—See Levett Co.

Levett Co., Walker M., 417-21 E. 23d St., New York, N. Y. "Magnalite," Levettal," "Herculite." (See page 505.)

Light Mfg. & Foundry Co., Pottstown, Pa.

Limerick Co., J. Arthur, 960 N. Howard St., Baltimore, Md.

Logansport Castings Co., Logansport, Ind.

Lynite—See Aluminum Castings Co.

McAdamite Aluminum Co., 57-83 Isabella Ave., Detroit, Mich.

McKenna Brass & Mfg. Co., First Ave. & Ross St., Pittsburgh, Pa. (See page 481.)

Machinists Foundry Co., Tenth St. & Macedonia Ave., Muncie, Ind.

Magnalite—See Levett Co.

Maluminum—See Kramm Foundry Co.

Michaels Bronze Co., 230-40 Scott St., Covington, Ky.

Mills Brass Co., W. A., Portchester, N. Y.

Monumental Bronze Co., 354 Howard St., Bridgeport, Conn.

Muskegon Aluminum Foundry Co., Clay & Ninth Sts., Muskegon, Mich.

Nabralco—See National Bronze & Aluminum Foundry Co.

National Brass Mfg. Co., 191-93 Mill St., Rochester, N. Y.

National Bronze & Aluminum Foundry Co., 2539 E. 79th St., Cleveland, O. "Nabralco."

Nestco—See Newark Stamping & Foundry Co.

Newark Stamping & Foundry Co., Newark, O. "Nestco."

North & Judd Mfg. Co., New Britain, Conn. (See page 521.)

Oberdorfer Brass Co., M. L., 804 E. Water St., Syracuse, N. Y.

Parker White-Metal & Machine Co., 23rd & Railroad Sts., Erie, Pa. (See page 655.)

Paulson & Son, Thomas, 97 Second Ave., Brooklyn, N. Y. (See page 211.)

Phoenix Die Casting Co., 21 Illinois St., Buffalo, N. Y. (See page 161.)

Pioneer Brass Works, Indianapolis, Ind.

Pro. Econ. Foundries, Lake & Crown Sts., Bloomfield, N. J.

Providence Brass & Aluminum Foundry, 460 Eddy St., Providence, R. I.

Racine Aluminum & Brass Foundry Co., 1329 12th St., Racine, Wis.

Racine Brass & Iron Co., 1327 Racine St., Racine, Wis.

Reeves & Co., Paul S., 1415-25 Catharine St., Philadelphia, Pa.

Rider-Bagg Co., 369 Birnie Ave., Springfield, Mass.

Rincon Foundry Co., 349-65 Seventh St., San Francisco, Cal.

Rostand Mfg. Co., Milford, Conn.

Russ Co., W., 58th St. & Walworth Ave., Cleveland, O.

Sayre Stamping Co., Lockhart Bldg., Sayre, Pa.

Sharp Brass Works, J. C., Boyce & 20th Sts., Chattanooga, Tenn.

Shepard Sales Corp., 54 Taylor St., Springfield, Mass. (See page 867.)

Sherwood Brass Works, 1167 Jefferson Ave., E., Detroit, Mich.

Silver Aluminum Metal Co., 294-96 Taaffe Pl., Brooklyn, N. Y.

Standard Brass Foundry Co., 1331 Columbus Rd., N. W., Cleveland, O.

Standard Foundry Co., Hartford, Conn.

Superior Bronze Co., 520 W. 12th St., Erie, Pa.

Titanium Bronze Co., Niagara Falls, N. Y.

Villinger Mfg. Co., 643 Elmira Ave., Williamsport, Pa.

Warman Aluminum Castings Co., 1741-43 Central Ave., Cincinnati, O.

Werne—See General Bronze Foundry Co.

Werra Aluminum Foundry Co., Waukesha, Wis. (See page 157.)

Western Brass Mfg. Works, Marshall Blvd., 21st St. & C., B. & Q. R. R., Chicago, Ill.

Williams & Son, E. A., 105-11 Plymouth St., Jersey City, N. J.

Wisconsin Aluminum Foundry Co., 16th & Franklin Sts., Manitowoc, Wis.

CASTINGS, BRASS—See Castings, Bronze and Brass

CASTINGS, Bronze and Brass

Adams & Westlake Co., Chicago, Ill. "Adlake." (See page 383.)

Adlake—See Adams & Westlake Co.

Advance Brass Mfg. Co., E. Western Ave., Muskegon, Mich.

Aetna Brass Mfg. Co., 1633 E. 55th St., Cleveland, O.

Alloy Foundry & Machine Corp., 73 Cedar St., New Rochelle, N. Y.

Aluminum Castings Co., Cleveland, O. "Lynux." (See page 157.)

American Brass & Iron Co., Detroit, Mich. (See page 153.)

American Bronze Corp., Berwyn, Pa. (See page opp. inside front cover.)

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B B

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Trade Mark

Made by Specialists

Your men and your machines can't produce bronze bushings and bearings as well, as quickly or as cheaply as our highly specialized plant and force can.

Turn your specifications over to us and get out from under the bother and trouble. Buy the finished product and let your machines and men get busy on your most productive units.

Bunting

Finished Bronze

Bushings and Bearings

(Patented)

Over 10,000 standard sizes, or made to your order.

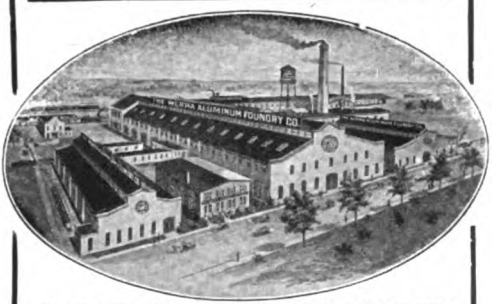
The Bunting Brass & Bronze Co.

737 Spencer St.

Toledo, Ohio

B B

ALUMINUM CASTINGS



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WAUKESHA, WIS. MISHAWAKA, IND.

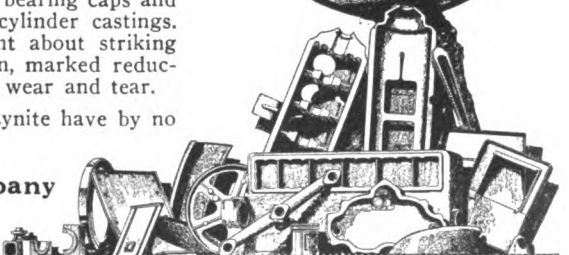
The Way to Better Design

Progress in motor-car design depends largely upon what materials are available for the engineer's use. Radical improvements in materials almost invariably lead to improvements in design.

Thus the production of Lynite has given great impetus to the development of the automobile. Within a few years it has contributed greatly to bettering the product of more than forty engine and car builders.

It has eliminated excess weight from thirty-five or forty car and engine parts, from little bearing caps and hand-hole covers up to huge enbloc cylinder castings. By its use for pistons, it has brought about striking increases in flexibility and acceleration, marked reduction in carbon deposits and decreased wear and tear.

Moreover, the full possibilities of Lynite have by no means been achieved.



The Aluminum Castings Company

Cleveland, Ohio.

LYNITE

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CASTINGS, Bronze and Brass (Continued)

American Bronze Co., 90-108 Arthur St., Buffalo, N. Y.

American Foundry Co., 634 S. 11th St., Newark, N. J.

American Manganese Bronze Co. (Holmesburg), Philadelphia, Pa.

Amesbury Brass & Foundry Co., Amesbury, Mass.

Anderson Foundry Co., Wm. B., 24-30 S. Clinton St., Chicago, Ill.

Atlas Brass Foundry, 155 A St., Boston, Mass.

Atlas Brass Foundry Co., Columbus, O. (See page 539.)

Attwood Brass Works, Grand Rapids, Mich. (See page 531.)

Bassick Co., 38 Austin St., Bridgeport, Conn.

Bay City Foundry & Machine Co., 26th & Water Sts., Bay City, Mich.

Bay View Foundry Co., McDonough, Water & Shelby Sts., Sandusky, O.

Blake, Edwin J., 565 Windsor St., Hartford, Conn.

Bohn Foundry Co., Chas. B., 738-66 Hart Ave., Detroit, Mich.

Brass & Bronze Co., 6515 Carnegie Ave., S. E., Cleveland, O.

Brown Bros., 46-48 Garden St., Stamford, Conn.

Buckeye Brass & Mfg. Co., 1807 Columbus Rd., Cleveland, Ohio.

Buckeye Iron & Brass Works, 324 E. Third St., Dayton, O.

Buffalo Non-Ferrous Castings & Mfg. Co., 43 Letchworth St., Buffalo, N. Y.

Bunting Brass & Bronze Co., 737 Spencer St., Toledo, O. (See page 157.)

Cantrell Hdw. & Tool Co., Reading, Pa.

Carter, E. T., Plainville, Conn.

Central Brass Foundry, 105-07 S. Clinton St., Chicago, Ill.

Central Brass Mfg. Co., Cleveland, O.

Central Brass & Fixture Co., Dept. A, Springfield, O. (See page 137.)

Champion Brass Works, 260 Division St., Coldwater, Mich.

Chicago Hardware Foundry Co., North Chicago, Ill.

City Brass Foundry Co., 5310 St. Clair Ave., N. E., Cleveland, O.

Clayton & Lambert Mfg. Co., Detroit, Mich. (See page 743.)

Cleveland Aluminum Casting Co., Addison Rd. & St. Clair Ave., Cleveland, O.

Cochrane Brass Foundry Co., York, Pa.

Cochrane Brass & Mfg. Co., J. A., 1403 E. 40th St., Cleveland, O.

Commonwealth Brass Corp., Commonwealth Ave. & Grand Trunk Ry., Detroit, Mich.

Cramp & Sons Ship & Engine Bldg. Co., William, Philadelphia, Pa. (See page 453.)

Dallas Brass & Copper Co., Chicago, Ill. (Dealers.) (See page 259.)

Damascus Bronze Co., Pittsburgh, Pa.

Dayton Bronze Bearing Co., 916-18 E. Third St., Dayton, O.

D'Este Co., Julian, 26 Canal St., Boston, Mass.

Delaware Brass & Aluminum Co., 20th & Walnut Sts., Muncie, Ind.

Detroit Motor Casting Co., 299-303 Beaufait Ave., Detroit, Mich.

Diamond Brass Foundry & Machine Co., 1115 Washington Blvd., Chicago, Ill.

Dorchester Brass & Aluminum Foundry, Old Sturtevant Bldg. (Jamaica Plain), Boston, Mass.

Eagle—See Stillman White Foundry Co.

Edna Brass Mfg. Co., 525-33 Reading Rd., Cincinnati, O.

Electric Materials Co., North East, Pa.

Elephant—See Phosphor Bronze Smelting Co.

Ellison Brass Mfg. Co., Jamestown, N. Y.

Ellsworth Brass Foundry Co., 249 R. R. Ave., Bridgeport, Conn.

Essex Brass Foundry Co., Sixth & Harvard Sts., Cambridge, Mass.

Eureka Brass Co., 2210-18 Scott Ave., St. Louis, Mo.

Eureka Co., North East, Pa.

Exeter Brass Works, Exeter, N. H.

Faries Mfg. Co., Decatur, Ill.

Federal Brass Works, 362-74 Trombley Ave., Detroit, Mich.

Fischer Sweeney Bronze Co., 13th & Grand Sts., Hoboken, N. J.

Fitz Water Wheel Co., Penn St. & Penna. R. R., Hanover, Pa.

Fore River Shipbuilding Corp., Quincy, Mass.

Foster, Merriam & Co., 31 Cross St., Meriden, Conn.

General Aluminum & Brass Mfg. Co., Detroit, Mich. (See page 155.)

General Bronze Foundry Co., 4800 Hamilton Ave., Cleveland, O.

General Castings Co., Ford Bldg., Detroit, Mich.

Germann Bronze Co., 355 W. 19th St., Erie, Pa.

Gerson-Carey Co., Kalamazoo St. & L. S. Ry., Lansing, Mich.

Glantz & Johnson, 108 Foote Ave., Jamestown, N. Y.

Hall Co., William, Quincy, Mass.

Harley Co., Springfield, Mass. (See page 185.)

Harper, Thomas, 204 Lafayette St., New York, N. Y.

Hemsher Metal Co., 18 Rapelyea St., Brooklyn, N. Y.

Henry-Bonnard Bronze Co., Mt. Vernon, N. Y.

Hoboken Brass Co., Seventh & Madison Sts., Hoboken, N. J.

Homer Brass Works, 231 Race St., Philadelphia, Pa.

Hotz Foundry & Mfg. Co., Fremont, O.

Howard Metal Co., Second & Canal Sts., Reading, Pa.

Ideal Bronze Co., Cleveland, O. (See page 451.)

Imperial Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill. (See page 733.)

Indianapolis Brass Co., 1012 E. Michigan St., Indianapolis, Ind.

Industrial Foundry & Machine Co., Water St., Pottstown, Pa.

Ives Co., H. B., 5-17 Artizan St., New Haven, Conn.

Jefferson Brass Foundry, 209 King St., Brooklyn, N. Y.

Johnson Bronze Co., Mill St., New Castle, Pa.

K & M Brass & Aluminum Castings Co., 10611-13 Quincy Ave., Cleveland, O.

Keyless Lock Co., 1401 Newman St., Indianapolis, Ind.

Kokomo Brass Works, 1415 Webster St., Kokomo, Ind.

Langsenkamp-Wheeler Brass Works, 1206-38 Shelby St., Indianapolis, Ind.

Lee Co., Wm. O., Port Huron, Mich.

Leitelt Bros., 7725 S. Chicago Ave., Chicago, Ill.

Levering Bros., 210 Key Highway, Baltimore, Md.

Levett Co., Walker M., 417-21 E. 23d St., New York, N. Y. "Magnalite." (See page 505.)

Light Mfg. & Foundry Co., Pottstown, Pa.

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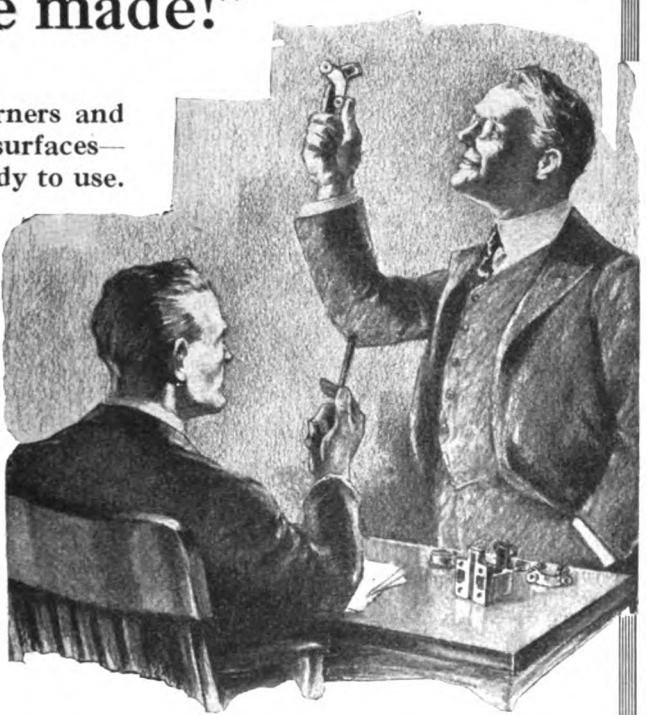
"THAT'S the way a casting should be made!"

Clean, sharp corners and edges, smooth surfaces—true to size—ready to use.



You Can Always Depend Upon

Precision Die Castings

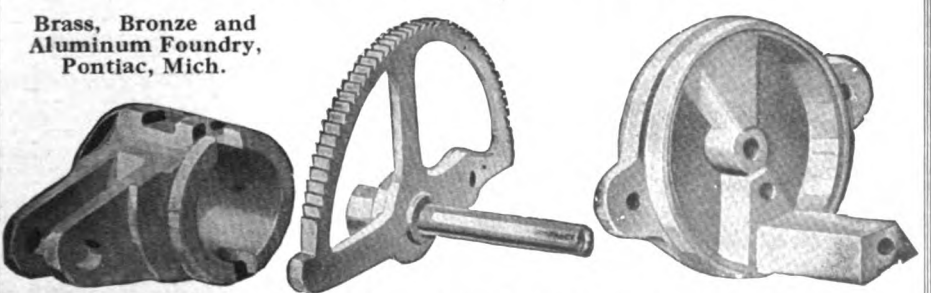
To reduce labor costs, to eliminate a large percentage of machine work, to speed production. If you are interested in these, ask our representative to call.

PRECISION CASTINGS CO.

INCORPORATED

SYRACUSE, N. Y., U. S. A.

Brass, Bronze and Aluminum Foundry, Pontiac, Mich.



Note the clean cut edges and smooth surfaces of these Precision Castings.

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CASTINGS, Bronze and Brass (Continued)

Limerick Co., J. Arthur, 960 N. Howard St., Baltimore, Md.
Logansport Castings Co., Logansport, Ind.
Lumen Bearing Co., 197 Lathrop St., Buffalo, N. Y.
Lynux—See Aluminum Castings Co.
McGill Metal Co., Valparaiso, Ind.
McKenna Brass & Mfg. Co., First Ave. & Ross St., Pittsburgh, Pa. (See page 481.)
Machinists Foundry Co., Tenth St. & Macedonia Ave., Muncie, Ind.
Magnolite—See Levett Co.
Maxwell Engineering Co., Rome, N. Y.
Medina Stamping & Machine Co., 317 Main St., Medina, N. Y.
Mesta Machine Co., Pittsburgh, Pa.
Metropolitan Mfg. Co., Oakman Ave. & Detroit Terminal R. R., Detroit, Mich. (See page 641.)
Michaels Bronze Co., 230-40 Scott St., Covington, Ky.
Mills Brass Co., W. A., Portchester, N. Y.
Milwaukee Valve Co., 189 Burrell St., Milwaukee, Wis.
Monumental Bronze Co., 354 Howard St., Bridgeport, Conn.
Mueller Metal Co., 288 Dyer St., Providence, R. I.
Muskegon Aluminum Foundry Co., Clay & Ninth Sts., Muskegon, Mich.
Nabralco—See National Bronze & Aluminum Foundry Co.
National Brass Mfg. Co., 191-93 Mill St., Rochester, N. Y.
National Bronze & Aluminum Foundry Co., 2539 E. 79th St., Cleveland, O. "Nabralco."
Nestco—See Newark Stamping & Foundry Co.
Newark Stamping & Foundry Co., Newark, O. "Nestco."
Niagara Brass Mfg. Co., 163-65 Adams St., Buffalo, N. Y.
Nolte Brass Co., 27-29 W. Jefferson St., Springfield, O.
North & Judd Mfg. Co., New Britain, Conn. (See page 521.)
Norwalk Brass Co., Keyser Pl., South Norwalk, Conn.
Oberdorfer Brass Co., M. L., 304 E. Water St., Syracuse, N. Y.
Onondaga Brass Co., Decker & Brown Sts., Syracuse, N. Y.
Parker White-Metal & Machine Co., 23rd & Railroad Sts., Erie, Pa. (See page 655.)
Paulson & Son, Thomas, 97 Second Ave., Brooklyn, N. Y. (See page 211.)
Pfau Mfg. Co., Cincinnati, O.
Phosphor Bronze Smelting Co., 2200 Washington Ave., Philadelphia, Pa. "Elephant."
Pioneer Brass Works, Indianapolis, Ind.
Pittsburgh Brass Mfg. Co., 32d St. & Penn Ave., Pittsburgh, Pa.
Pro. Econ. Foundries, Lake & Crown Sts., Bloomfield, N. J.
Progressive Brass Foundry, Keowee & Herbert Sts., Dayton, O.
Providence Brass & Aluminum Foundry, 460 Eddy St., Providence, R. I.
Racine Aluminum & Brass Foundry Co., 1329 12th St., Racine, Wis.
Reeves & Co., Paul S., 1415-25 Catharine St., Philadelphia, Pa.
Regar Brass Mfg. Co., 1523 E. 45th St., Cleveland, O. (See page 785.)
Rider-Bagg Co., 369 Birnie Ave., Springfield, Mass.
Rincon Foundry Co., 349-65 Seventh St., San Francisco, Cal.
Rome Locomotive & Machine Works, Rome, N. Y.
Rostand Mfg. Co., Milford, Conn.
Russ Co., W., 58th St. & Walworth Ave., Cleveland, O.
"S-C" Regulator Co., Perry & High Sts., Fostoria, O.
Sayre Stamping Co., Lockhart Bldg., Sayre, Pa.
Sharp Brass Works, J. C., Boyce & 20th Sts., Chattanooga, Tenn.
Shepard Sales Corp., 54 Taylor St., Springfield, Mass. (See page 867.)
Sherwood Brass Works, 1167 Jefferson Ave., E., Detroit, Mich.
Smith Mfg. Co., A. P., Norman & Lawrence Sts., East Orange, N. J.
Spencer's Sons, I. S., Guilford, Conn.
Staats & Co., Geo., 74 Bayard St., Brooklyn, N. Y.
Standard Brass Foundry Co., 1831 Columbus Rd., N. W., Cleveland, O.
Standard Foundry Co., Hartford, Conn.
Sterling Specialty Co., New Comerstown, O.
Stillman White Foundry Co., 1 Bark St., Providence, R. I. "Eagle."
Suffolk Casting & Supply Co., 156 Pearl St., Boston, Mass.
Superior Bronze Co., 520 W. 12th St., Erie, Pa.
Thiery & Kendrick Mfg. Co., Detroit, Mich. (See page 185.)
Thomson Press Co., John, 253 Broadway, New York, N. Y.
Titanium Bronze Co., Niagara Falls, N. Y.
Turner & Seymour Mfg. Co., Torrington, Conn.
Tuttle & Bailey Mfg. Co., 52 Vanderbilt Ave., New York, N. Y.
Union Metal Works, Chelsea, Mass.
Unique Brass Foundry Co., 833-41 Grant St., Buffalo, N. Y.
Vanadium Metals Co., Vanadium Bldg., Pittsburgh, Pa. "Victor."
Victor—See Vanadium Metals Co.
Villinger Mfg. Co., 643 Elmira Ave., Williamsport, Pa.
Waterbury Mfg. Co., 568 Main St., Waterbury, Conn.
Welbronco—See Wellman Bronze Co.
Wellman Bronze Co., 6017 Superior Ave., Cleveland, O. "Welbronco."
Wells Chemical Bronze Works, Temple & Harding Sts., Worcester, Mass.
Western Brass Mfg. Works, Marshall Blvd., 21st St. & C., B. & Q. R. R., Chicago, Ill.
Williams Valve Co., D. T., Spring Grove Ave. & Township St., Cincinnati, O.
Williams & Son, E. A., 105-11 Plymouth St., Jersey City, N. J.
Woodruff & Sons Co., Walter W. Mount Carmel, Conn.

CASTINGS, COMPOSITION—See Castings, Bronze and Brass

CASTINGS, Die

Acme Die-Casting Corp., 35th St. & Third Ave., Brooklyn, N. Y.
Alemite Metals Co., 341-51 W. Chicago Ave., Chicago, Ill. (See page 167.)
Alloy Die Casting Co., Detroit, Mich.
American Die Casting Co., Indianapolis, Ind. (See page 167.)
Barnhart Bros. & Spindler, 32 Throop St., Chicago, Ill.
Die Casting Co. of New Jersey, Irvington, N. J.
Doehler Die-Casting Co., Brooklyn, N. Y. (See page 181.)

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Die Castings

The dependable kind
Made from White Metal Alloys

Accurate—Dense and True to Specifications

Let us have your prints for estimate. We shall be glad to recommend an alloy suitable for your purpose and give you the benefit of the knowledge gained during our thirty-five years in the mixed metal business.

HOYT METAL COMPANY

Largest manufacturers of White Metal Alloys in the World

300 North Broadway, St. Louis
111 Broadway, New York
1205 Westminster Bldg., Chicago
308 Moffatt Bldg., Detroit
Eastern and Lewis Sts., Toronto

DIE CASTINGS

ZINC TIN AND ALUMINUM ALLOYS

WRITE FOR PRICES

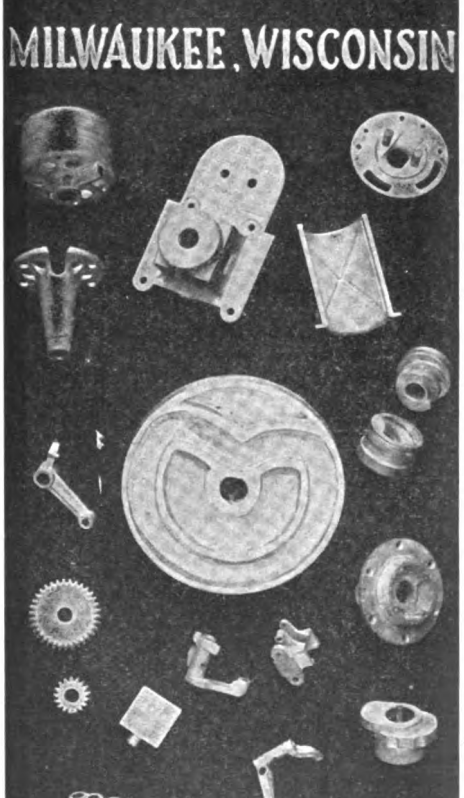
Phoenix Die Casting Co.

21 Illinois St., Buffalo, N.Y.

MILWAUKEE DIE CASTING CO.

DIFFICULT WORK
ACCURACY
QUALITY AND
PROMPT SERVICE

MILWAUKEE, WISCONSIN



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CASTINGS, Die (Continued)

Franklin Mfg. Co., 736 Gifford St., Syracuse, N. Y. (See page 179.)

Fritz, Perry E., 2939 Sunrise St., Los Angeles, Cal.

General Aluminum & Brass Mfg. Co., Detroit, Mich. (See page 155.)

Germann Bronze Co., 355 W. 19th St., Erie, Pa.

Grey Mfg. Co., C. M., 358 Central Ave., East Orange, N. J.

Harley Co., Springfield, Mass. (See page 185.)

Hoyt Metal Co., 300 N. Broadway, St. Louis, Mo. (See page 161.)

Indiana Die Casting Co., Cornell & 11th Sts., Indianapolis, Ind. (See page 165.)

Kidder-Oswald Co., Dayton, O.

Legler-Ellerman Co., E. Bacon St., Dayton, O.

Levering Bros., 210 Key Highway, Baltimore, Md.

Light Mfg. & Foundry Co., Pottstown, Pa.

Lumen Bearing Co., 197 Lathrop St., Buffalo, N. Y.

Milwaukee Die Casting Co., Milwaukee, Wis. (See page 161.)

Modern Die & Tool Co., Indianapolis, Ind. "Victor." (See page 349.)

Mogul Metal Co., Detroit, Mich. (See page 167.)

Mussy-Lyon Co., Detroit, Mich. (See page 167.)

National Lead Co., 111 Broadway, New York, N. Y. (See page 519.)

Parker White-Metal & Machine Co., 23rd & Railroad Sts., Erie, Pa. (See page 655.)

Phoenix Die Casting Co., 21 Illinois St., Buffalo, N. Y. (See page 161.)

Precision Castings Co., Syracuse, N. Y. (See page 159.)

Sanford Co., David C., 33-39 Drouve St., Bridgeport, Conn.

Sargent & Co., Water & Wallace Sts., New Haven, Conn.

Stewart Mfg. Corp., K., 4535 Fullerton Ave., Chicago, Ill.

Stroh Die Moulded Casting Co., 161-71 Michigan St., Milwaukee, Wis.

Veeder Mfg. Co., 22 Sargeant St., Hartford, Conn.

Victor—See Modern Die & Tool Co.

White Brass Casting Co., 1656 Austin Ave., Chicago, Ill.

Wing & Co., J. T., 15-19 Woodward Ave., Detroit, Mich.

CASTINGS, Grey Iron

Acme Foundry Co., Detroit, Mich.

Adamite—See Pittsburgh Iron & Steel Foundries Co.

Adrian Steel Casting Co., Adrian, Mich.

Allyne-Ryan Foundry Co., Aetna Rd. & E. 91st St., Cleveland, O.

American Car & Foundry Co., Detroit, Mich.

American Foundry & Mfg. Co., 11th & Herbert Sts., St. Louis, Mo.

American Tool & Machine Co., Boston, Mass.

American Tube Co., 37th & Rockwell Sts., Chicago, Ill.

Arnold Co., Hoyt St., Norwalk, Conn.

Atlas Foundry Co., Military St., Detroit, Mich.

Auto Castings Co., 2088 Scranton Rd., Cleveland, O.

Barker, James, Sixth & Cayuga Sts., Philadelphia, Pa.

Barlow Foundry Co., 551 N. J. R. R. Ave., Newark, N. J.

Barnes Foundry Co., 171 Second St., Jersey City, N. J. (See page 187.)

Bay City Foundry & Machine Co., 26th & Water Sts., Bay City, Mich.

Bay View Foundry Co., McDonough, Water & Shelby Sts., Sandusky, O.

Bridgeport Malleable Iron Works, Bridgeport, Conn.

Buch's Sons Co., A., Elizabethtown, Pa.

Byram Foundry Co., 921 Biddle St., Indianapolis, Ind.

Campbell Mfg. & Foundry Co., 608 W. Western Ave., Muskegon, Mich.

Campbell, Wyant & Cannon Foundry Co., Muskegon, Mich. (See page 185.)

Cantrell Hdw. & Tool Co., Reading, Pa.

Central Foundry Co., 705-23 Park St., Milwaukee, Wis.

Cheney & Son, S., Manlius, N. Y.

Detroit Foundry Co., N. Grand Blvd. & Riopelle St., Detroit, Mich.

East Iron & Machine Co., Lima, O.

Ecorse Foundry & Machine Co., Ecorse, Mich.

Empire Foundry Co., Jersey Ave., New Brunswick, N. J.

Enterprise Foundry Co., 1127-57 E. Warren Ave., Detroit, Mich.

Fanner Mfg. Co., Brookside Pk., Cleveland, O.

Farrar & Trefts, Perry & Illinois Sts., Buffalo, N. Y.

Ferro Machine & Foundry Co., 47 Hubbard Ave., Cleveland, O.

Flagg & Co., Stanley G., Morris Bldg., Philadelphia, Pa.

Foster, Merriam & Co., 31 Cross St., Meriden, Conn.

France Foundry & Machine Co. (N. Baltimore), Baltimore, O.

Frontier Iron Works, 41 Letchworth St., Buffalo, N. Y.

Fulton Foundry & Machine Co., 25 Furman St., Brooklyn, N. Y.

Great Lakes Foundry Co., 30th & Moak Sts., Port Huron, Mich.

Griswold Mfg. Co., 1055 W. 12th St., Erie, Pa.

Hart-Parr Co., Lawler St., Charles City, Ia.

Holyoke Motor Foundry Co., Holyoke, Mass.

Hoosier Castings Co., 17th & Columbia Aves., Connersville, Ind.

Illinois Malleable Iron Co., 1801-25 Diversey Blvd., Chicago, Ill.

Inland Steel Casting Co., 19th & Cedar Sts., Terre Haute, Ind.

Interstate Foundry Co., E. 61st St. & Erie R. R., Cleveland, O.

Iron City Foundry Co., Hamilton, O.

Knott & Harker Co., Beaver Falls, Pa.

Lakey Foundry & Machine Co., First & Water Sts., Muskegon, Mich.

Levering Bros., 210 Key Highway, Baltimore, Md.

Logansport Castings Co., Logansport, Ind.

Lovewell-Henrici Co., 936-42 Broadway, Chelsea, Mass.

Lycoming Foundry & Machine Co., Williamsport, Pa.

McFarland Foundry & Machine Co., Trenton, N. J.

Machinists Foundry Co., Tenth St. & Macedonia Ave., Muncie, Ind.

Manufacturers Foundry Co., Waterbury, Conn. (See page 163.)

Motor Castings Co., 710-50 Hart Ave., Detroit, Mich.

Muncie Foundry & Machine Co., Muncie, Ind. (See page 359.)

Murphy Foundry Co., Beaver Falls, Pa.

National Sewing Machine Co., Belvidere, Ill.

Naugatuck Malleable Iron Co., Naugatuck, Conn.

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Quality Castings

M.F.Co.

If you would visit our wonderfully equipped plant at Waterbury and see how our castings are made, you would understand our reasons for calling them "quality castings."

Everything that can assure a finished product, free from flaws of construction or errors of design, is carried out in our foundry. We are specialists in the manufacture of castings. Our formulæ are based on actual experience. We have increased our capacity to meet the growing demand for our superior castings. Our experience in this line guarantees you a perfect product.

MANUFACTURERS FOUNDRY CO.

WATERBURY, CONN.

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CASTINGS, Grey Iron (Continued)

Palmer & De Mooy Foundry Co., 1658 Leonard St., Cleveland, O.

Peerless Foundry, Hamilton, O.

Pequonnock Foundry, Fifth St. Extension, Bridgeport, Conn.

Pittsburgh Iron & Steel Foundries Co., Pittsburgh, Pa. "Adamite."

Plymouth Motor Castings Co., Plymouth, Mich.

Portland Forge & Foundry Co., Portland, Ind.

Racine Brass & Iron Co., 1327 Racine St., Racine, Wis.

Racine Foundry Co., Tenth St. & C., M. & St. P. Ry., Racine, Wis.

Reedy Foundry Co., 4600 Iowa St., Chicago, Ill.

Reliance Foundry Co., 16th & North F Sts., Richmond, Ind.

Rincon Foundry Co., 349-65 Seventh St., San Francisco, Cal.

Riverside Foundry Co., Wrightsville, Pa.

Romeo Foundry Co., Port Huron, Mich.

Sanitary Co. of America, Linfield, Pa.

Smith Mfg. Co., A. P., Norman & Lawrence Sts., East Orange, N. J.

Smith Mfg. Co., Philip, Sidney, O.

Sowers Mfg. Co., 1296 Niagara St., Buffalo, N. Y. (See page 243.)

Spencer's Sons, S., Guilford, Conn.

Spring City Foundry Co., St. Paul Ave. & State St., Waukesha, Wis.

Sta-Rite Engine Co., La Crosse, Wis.

Standard Foundry Co., Forest & Kewaunee Sts., Racine, Wis.

Stowell Mfg. & Foundry Co., South Milwaukee, Wis.

Stroh Castings Co., Chene & Guoin Sts., Detroit, Mich.

Suffolk Casting & Supply Co., 156 Pearl St., Boston, Mass.

Susquehanna Casting Co., Wrightsville, Pa.

Textile Machine Works, Reading, Pa.

Trenton Malleable Iron Co., New York Ave., Trenton, N. J.

Turner & Seymour Mfg. Co., Torrington, Conn.

Tuttle & Bailey Mfg. Co., 52 Vanderbilt Ave., New York, N. Y.

Union Mfg. Co., New Britain, Conn.

Universal Foundry Co., Pine & Warren Sts., Oshkosh, Wis.

Urick Foundry Co., 15th & Cherry Sts., Erie, Pa.

Wabash Foundry Co., Wabash, Ind.

Waterbury Castings Co., Railroad Hill St., Waterbury, Conn.

Weller Hdw. & Fdry. Co., Horseheads, N. Y.

Wellman-Seaver-Morgan Co., Cleveland, O.

Western Rope & Mfg. Co., 809-17 St. Paul Ave., Milwaukee, Wis.

Westinghouse Machine Co. (E. Pittsburgh), Pittsburgh, Pa.

Wilson Foundry & Machine Co., Pontiac, Mich.

Wisconsin Aluminum Foundry Co., 16th & Franklin Sts., Manitowoc, Wis.

Wisconsin Cylinder Foundry Co., Racine, Wis.

CASTINGS, IRON — See Castings, Grey Iron; also Castings, Malleable Iron

CASTINGS, Malleable Iron

Acme Steel & Malleable Iron Works, 245 Military Rd., Buffalo, N. Y.

Albion Malleable Iron Co., Albion, Mich.

American Malleables Co., Lancaster, N. Y.

Arcade Malleable Iron Co., Albany St., Worcester, Mass.

Auto Power & Malleable Mfg. Co., First Nat'l Bank Bldg., Omaha, Neb.

Auto Specialties Mfg. Co., St. Joseph, Mich. (See page 193.)

Badger Malleable & Mfg. Co., South Milwaukee, Wis.

Belle City Malleable Iron Co., 1500 Kewanee St., Racine, Wis.

Bridgeport Malleable Iron Works, Bridgeport, Conn.

Buhl Malleable Iron Co., Wight & Adair Sts., Detroit, Mich.

Chisholm-Moore Mfg. Co., Lakeside Ave. & E. 49th St., Cleveland, O.

Columbus Malleable Iron Co., Curtis Ave., Columbus, O.

Danville Malleable Iron Co., 900 N. Bowman Ave., Danville, Ill.

Decatur Malleable Iron Co., Decatur, Ill. (See page 193.)

Devlin Mfg. Co., Thos., Third & Lehigh Aves., Philadelphia, Pa.

Erie Malleable Iron Co., Erie, Pa.

Fanner Mfg. Co., Brookside Pk., Cleveland, O.

Flagg & Co., Stanley G., Morris Bldg., Philadelphia, Pa.

Fraser & Jones Co., Syracuse, N. Y. (See page 327.)

General Malleable Co., Warren, O.

Globe Malleable Iron & Steel Co., Syracuse, N. Y.

Hammond Malleable Iron Co., Summer St., Hammond, Ind.

Illinois Malleable Iron Co., 1801-25 Diversey Blvd., Chicago, Ill.

Inland Steel Casting Co., 19th & Cedar Sts., Terre Haute, Ind.

Jewel Steel & Malleable Co., 373 Hertel Ave., Buffalo, N. Y.

Johnson & Co., Isaac G., Spuyten Duyvil, New York, N. Y.

Malleable Iron Fittings Co., Branford, Conn.

Marion Malleable Iron Works, Dept. A, Marion, Ind. (See page 767.)

Meeker Foundry Co., 95 Clay St., Newark, N. J.

National Malleable Castings Co., Cleveland, O.

Naugatuck Malleable Iron Co., Naugatuck, Conn.

North & Judd Mfg. Co., New Britain, Conn. (See page 521.)

Ohio Malleable Iron Co., Columbus, O.

Platt Mfg. Co., Wm. E., 35 W. Lake St., Chicago, Ill.

Rhode Island Malleable Iron Works, Hills Grove, R. I.

Saginaw Malleable Iron Co., Center & Salt Sts., Saginaw, Mich.

Springfield Malleable Iron Co., Bechtle Ave. & Big Four R. R., Springfield, O.

Stowell Mfg. & Foundry Co., South Milwaukee, Wis.

Suffolk Casting & Supply Co., 156 Pearl St., Boston, Mass.

Syracuse Malleable Iron Works, Syracuse, N. Y.

Temple Malleable Iron & Steel Co., Harrison Bldg., Philadelphia, Pa.

Terre Haute Malleable & Mfg. Co., 19th St. & Maple Ave, Terre Haute, Ind.

Trenton Malleable Iron Co., New York Ave., Trenton, N. J.

Troy Malleable Iron Works, Troy, N. Y.

United States Malleable Iron Co., Woodville St., Toledo, O.

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"Indiana" Die Castings

Our entire plant is designed and equipped for the manufacture of "Indiana" Die Castings in White Metal Alloys exclusively.

Doing nothing else, we naturally do that one thing well.

MANY difficult Die Cast jobs have been successfully done the "Indiana way"—jobs that were pronounced uncastable.

"Indiana" Die Cast parts can be delivered with each hole, slot, boss and recess accurately located, leaving no machine work required.

"Indiana" Die Castings lend themselves readily to plating or enameling.

"Indiana" Die Castings can be assembled as received—you use no power, experience nor loss of defective machined castings and are freed from financial investment in machinery, patterns, jigs, fixtures and tools, except dies necessary to die cast. Even this we absorb on the first few thousand castings, leaving you with absolutely no investment.

Send us your blue prints or model of parts and let us come back with an actual cost to you of the parts Die Cast the "Indiana" way.

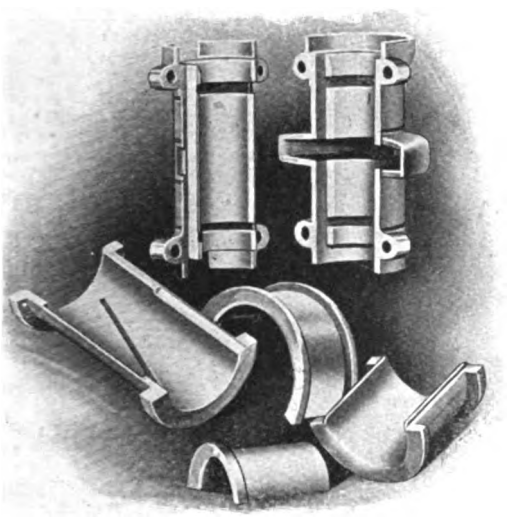
"The Indiana Way" means Die Castings

NON-POROUS

WITHOUT BLOW HOLES

NO SPONGY SPOTS

UNIFORM IN WEIGHT *and* DIMENSIONS



"D" Metal

Main ingredient zinc, very hard; in its tensile strength compares favorably with cast iron; not recommended for use in connection with water or steam; plates any color; holds threads well.

"A" Metal

Main ingredient lead. Hardened with tin and antimony. Adapted to resist water and steam.

"C" Metal

Non-corrosive, anti-friction. Main ingredient lead. A low-priced bearing metal for slow speed work.

"AA" Metal

High class non-corrosive anti-friction alloy. Main ingredient tin, hardened with antimony and copper.

Adapted to high-speed bearings of all kinds, and giving special satisfaction in internal combustion motors.

"INDIANA" DIE CASTING COMPANY

Cornell and 11th Streets **Indianapolis, Indiana**

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CASTINGS, Malleable Iron (Continued)

Vermilion Malleable Iron Co., Hoopeston, Ill. (See page 783.)

Vulcan Iron Works, New Britain, Conn.

Western Malleables Co., Beaver Dam, Wis.

Wilmington Malleable Iron Works, Wilmington, Del.

CASTINGS, Steel

Acme Steel & Malleable Iron Works, 245 Military Rd., Buffalo, N. Y.

Adamite—See Pittsburgh Iron & Steel Foundries Co.

Adrian Steel Castings Co., Adrian, Mich.

Allison & Co., Chester, Pa. (See page 597.)

American Steel Foundries, 332 S. Michigan Ave., Chicago, Ill.

Auto Castings Co., 2088 Scranton Rd., Cleveland, O.

Besco—See Clark Equipment Co.

Bethlehem Steel Co., Third & Poplar Sts., South Bethlehem, Pa.

Buhl Malleable Iron Co., Wight & Adair Sts., Detroit, Mich.

Chester Steel Castings Co., Chester, Pa.

Chicago Steel Foundry Co., Kedzie Ave. & 37th St., Chicago, Ill.

Clark Equipment Co., Buchanan, Mich. "Besco."

Cincinnati Steel Castings Co., Queen City & Spring Grove Aves., Cincinnati, O.

Crucible Steel Casting Co., Lansdowne, Pa.

Crucible Steel Castings Co., 612 Clinton St., Milwaukee, Wis.

Damascus Crucible Steel Casting Co., New Brighton, Pa.

Dayton Steel Foundry Co., Chapel Rd. & C. H. & D. R. R., Dayton, O.

Eagan-Rogers Steel & Iron Co., Crum Lynne, Pa.

Eastern Steel Castings Co., 30 Kemble St., Boston, Mass.

Electric Steel Co. of Indiana (Speedway City), Indianapolis, Ind.

Farrell-Cheek Steel Foundry Co., Sandusky, O.

Firth & Son Co., Rowland, Phillipsburg, N. J.

Flagg & Co., Stanley G., Morris Bldg., Philadelphia, Pa.

Fort Pitt Steel Casting Co., McKeesport, Pa.

Gerlinger Steel Casting Co., 59th St. & National Ave., West Allis, Wis.

Hercules Steel Casting Co., 871-91 Robinson Ave., Milwaukee, Wis.

Hoosier Castings Co., 17th & Columbia Aves., Connersville, Ind.

Inland Steel Casting Co., 19th & Cedar Sts., Terre Haute, Ind.

Jewel Steel & Malleable Co., 373 Hertel Ave., Buffalo, N. Y.

Johnson & Co., Isaac G., Spuyten Duyvil, New York, N. Y.

Lebanon Steel Foundry, Front & Lehman Sts., Lebanon, Pa.

Malleable Iron Fittings Co., Branford, Conn.

Maynard Electric Steel Foundry Co., 710-16 Reed St., Milwaukee, Wis.

Mesta Machine Co., Pittsburgh, Pa.

Michigan Steel Casting Co., Detroit, Mich. (See page 241.)

Milbury Steel Foundry Co., Milbury, Mass.

Milwaukee Steel Foundry Co., S. Water & Virginia Sts., Milwaukee, Wis.

Monarch Steel Castings Co., Detroit, Mich.

National Malleable Castings Co., Cleveland, O.

National Steel Casting Co., Montpelier, Ind.

National Steel Foundries, ft. of Belleview Pl., Milwaukee, Wis.

Ohio Steel Foundry Co., James St. & Lagonda Ave., Springfield, O.

Pelton Steel Co., Chicago Ave. & Elliott Pl., Milwaukee, Wis.

Pittsburgh Iron & Steel Foundries Co., Pittsburgh, Pa. "Adamite."

Progressive Mfg. Co., 432 Barclay St., Milwaukee, Wis.

Pyro—See Swedish Crucible Steel Co.

Racine Steel Castings Co., Racine, Wis.

Reading Steel Casting Co., Reading, Pa.

Reed Foundry & Machine Co., Kalamazoo, Mich.

Riverside Steel Casting Co., Newark, N. J.

Sivyer Steel Casting Co., 37th Ave. & Mitchell St., Milwaukee, Wis.

Smith Steel Castings Co., Geo. H., 500 Clinton St., Milwaukee, Wis.

Standard Crucible Steel Castings Co., 717-23 30th St., Milwaukee, Wis.

Standard Steel Castings Co., 3311 W. 73d St., Cleveland, O.

Stock Process Steel Co., Detroit, Mich.

Strong Steel Foundry Co., Hertel Ave. & Norris St., Buffalo, N. Y.

Suffolk Casting & Supply Co., 156 Pearl St., Boston, Mass.

Swedish Crucible Steel Co., Butler St. & G. T. R. R., Detroit, Mich. "Pyro."

Taylor-Wharton Iron & Steel Co., High Bridge, N. J.

Teco—See Treadwell Engineering Co.

Toledo Steel Casting Co., Toledo, O.

Treadwell Engineering Co., Edelman & Lennox Sts., Easton, Pa. "Teco."

Union Steel Casting Co., Bartlett Sq. (Jamaica Plain), Boston, Mass.

Warren Steel Casting Co., Lyon & Dorcas Sts., St. Louis, Mo.

Wehr Steel Co., 45th & Gordon Aves., West Allis, Wis.

Wellman-Seaver-Morgan Co., Cleveland, O.

West Michigan Steel Foundry Co., ft. Western Ave., Muskegon, Mich.

West Steel Casting Co., 805-41 E. 70th St., Cleveland, O.

Western Rope & Mfg. Co., 809-17 St. Paul Ave., Milwaukee, Wis.

Whiteley Steel Co., 108½ Jefferson St., Muncie, Ind.

Whitman Co., A. P., Fourth & Booth Sts., Chester, Pa.

CASTLE NUTS—See Nuts, Castellated

CASTOR OIL—See Oil, Castor

CASTORS, WRECKING—See Trucks, Wrecking

CASTORS and WHEEL TRUCKS

(For turning cars in Garages; see also Turntables, Automobile)

Automobile Accessories Co., 824 W. North Ave., Baltimore, Md. "Norwood."

Norwood—See Automobile Accessories Co.

Weber Automobile Supply Co., 6 E. Kiowa St., Colorado Springs, Colo.

CATCHES and FASTENERS, Spring Cabinet

(For Heel Boards, Boxes or Cabinets)

Bassick Co., 38 Austin St., Bridgeport, Conn.

Brainerd Mfg. Co. (East Rochester), Rochester, N. Y.

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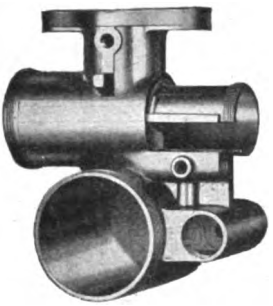
"AMERICAN"

DIE CAST
BEARINGS
and PARTS

BRONZE
BACKED
BABBITT
BEARINGS

American Die Casting Co.
Indianapolis - - Indiana

One of the most modern
DIE CASTING PLANTS
in the world
EQUIPPED FOR LARGE OUTPUT OF
Highest Grade Die-Castings



Carburetor Body
(Die Cast)
Complete Without Machining

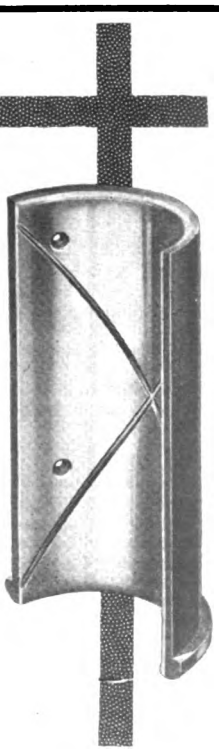
Send us samples or blue prints of your most accurate and intricate parts from which we will quote you prices in quantities.

Illustrated catalog sent on request

ALEMITE METALS CO.
341-351 W. Chicago Ave., Chicago, Ill.

Mogul
Bronze Babbitt lined *and* Die Cast Bearings

Bearings Specialists



For twenty years the Muzzy-Lyon Company has specialized on friction-reducing alloys.

For ten years we have manufactured bearings only, die cast and bronze babbitt lined.

Specializing on bearings, and nothing but bearings, enables us to give workmanship a degree of attention and skill that a general shop cannot equal.

This is why Mogul Bearings are specified wherever quality is the first consideration.

Muzzy-Lyon Company, Ltd.
Detroit, Michigan

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CATCHES and FASTENERS, Spring Cabinet (Continued)

Brass Goods Mfg. Co., 280 Nevins St., Brooklyn, N. Y.
Corbin Cabinet Lock Co., New Britain, Conn.
Sargent & Co., Water & Wallace Sts., New Haven, Conn.
Woodruff & Sons Co., Walter W., Mount Carmel, Conn.

CELLULOID CEMENT—See Cement, Celluloid

CELLULOID CURTAIN LIGHTS — See Lights, Curtain

CELLULOID, Sheet

(For windows in curtains and storm fronts)

Arlington Works, 725 Broadway, New York, N. Y. "Pyralin." (See page 169.)
Celluloid Co., 30 Washington Pl., New York, N. Y.
Fiberloid Co., 55 Fifth Ave., New York, N. Y.
Pyralin—See Arlington Works.

CEMENT, Aeroplane Waterproof

(See also Glue, Aeroplane Liquid)

Ulmer Leather Co., Norwich, Conn.

CEMENT, Cast Iron

(For repairing cracks in castings; for cement for repairing leaky radiators—See Cement, Radiator)

Brand Co., S. H., 559 W. Lake St., Chicago, Ill.
Central Foundry Supply Co., St. Clair Ave. & P. R. R., Columbus, O.
Clark Cast Steel Cement Co., Shelton, Conn. "Steamtite."
Hall-Thompson Co., Hartford, Conn. "Wonder Worker." (See page 739.)
Smooth-On Mfg. Co., Jersey City, N. J. (See page 341.)
Steamtite—See Clark Cast Steel Cement Co.
Stevens, Frederic B., Detroit, Mich. (See page 776.)
Wonder Worker—See Hall-Thompson Co.

CEMENT, Celluloid

(For repairing curtain lights)

Auto Products Co., 5739 Elmer St., Pittsburgh, Pa. "Cellu-Fix."
Auto Products Mfg. Co., Buffalo, N. Y. "No stitch." (See page 255.)
Cellu-Fix—See Auto Products Co.
No Stitch—See Auto Products Mfg. Co.

CEMENT, Gasket

(Substitutes for Shellac or White Lead)

Benoit, Constant A., Brooklyn, N. Y. "Permatex." (See page 169.)
Columbus Varnish Co., Columbus, O. "Peerless." (See page 253.)
Dannenhirsch Co., 1905 W. Dauphin St., Philadelphia, Pa. "Danno."
Danno—See Dannenhirsch Co.
Northwestern Chemical Co., 610 State St., Marietta, O. "Norwesco." (See page 205.)
Norwesco—See Northwestern Chemical Co.
Nu-Back Mfg. Co., 114 N. Commercial St., St. Louis, Mo.
Peerless—See Columbus Varnish Co.
Permatex—See Benoit, Constant A.
Van Cleef Bros., 7709-11 Woodlawn Ave., Chicago, Ill.

CEMENT, IRON—See Cement, Cast Iron

CEMENT, Linoleum

Ferdinand & Co., L. W., 152 Kneeland St., Boston, Mass. "20th Century." (See page 379.)
20th Century—See Ferdinand & Co.

CEMENT, METAL—See Cement, Cast Iron

CEMENT, Radiator Repair

(For repairing or sealing leaks in radiators)

Atlas Auto Supply Co., 697 W. Austin Ave., Chicago, Ill. (See page 207.)
Auto Products Mfg. Co., Buffalo, N. Y. "Sta-Fix." (See page 255.)
Auto Remedy Co., Evans St., Cincinnati, O. "Magic."
B. A. T. Co., Germantown & Stenton Aves., Philadelphia, Pa. "Panther."
Benoit, Constant A., Brooklyn, N. Y. "Permatex." (See page 169.)
Black Diamond—See Dunton Co.
Blue Ribbon—See International Metal Polish Co.
Boyer Chemical Co., 18 E. Kinzie St., Chicago, Ill.
Buffalo Specialty Co., 375 Ellicott St., Buffalo, N. Y. "Neverleak." (See page 517.)
Camden Chemical Mfg. Co., 18th & Mickle Sts., Camden, N. J. "Greyhound."
Check—See O-K Auto Supply.
Crum Mfg. Co., 120 N. Main St., Ottawa, Kans. "Radi-No-Leak."
Cumings Bros., Flint, Mich. "Stoppit."
Cure-A-Leak—See Dannenhirsch Co.
Dannenhirsch Co., 1905 W. Dauphin St., Philadelphia, Pa. "Cure-A-Leak."
Delphi Auto Specialty Co., Delphi, Ind.
Dunton Co., M. W., 150-52 Niagara St., Providence, R. I. "Black Diamond."
Durkee-Atwood Co., Minneapolis, Minn. "Rie-Nie."
E-Fec-Tiv—See Permatite Mfg. Co.
Eureka Stop Leak Co., Youngstown, O.
Ferguson, D. E., Vernon, Mich.
Gee-Bee—See Green Bay Supply Co.
Green Bay Supply Co., 518 Maine St., Green Bay, Wis. "Gee-Bee." (See page 207.)
Greyhound—See Camden Chemical Mfg. Co.
Hall-Thompson Co., Hartford, Conn. "Wonder Worker." (See page 739.)
Hollingshead Co., R. M., 112 N. Ninth St., Camden, N. J. "Whiz."
Hoof & Co., John C., 157 W. Illinois St., Chicago, Ill. "Howard Bros."
Howard Bros.—See Hoof & Co.
International Metal Polish Co., Quill St. & Belt R. R., Indianapolis, Ind. "Blue Ribbon."
Karbonoid Chemical Co., 318 East Ave., Elyria, O. "No-Le-Ko."
Leak Cure Metal Cement Co., 89 Fulton St., New York, N. Y.
Magic—See Auto Remedy Co.
Milwaukee Auto Specialty Co., 705-15 Chestnut St., Milwaukee, Wis.
Neverleak—See Buffalo Specialty Co.
No-Le-Ko—See Karbonoid Chemical Co.
Northwestern Chemical Co., 610 State St., Marietta, O. "Se-Ment-Ol." (See page 205.)

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WHY USE SHELLAC?

Mr. Dealer—Let Permatex Quality build your business. Ask your jobber for Discounts and Information about the Permatex Dealer's Catalogue, Four-Color Displays, and Selling Helps.

If your jobber cannot quote you, write us and we will see that you receive at once, all information from a Permatex Distributer in your immediate vicinity.

LIST PRICES

PERMATEX GASKET CEMENT
2 oz. swab bottles 20c
¼ pint cans 30c
1 pint cans 90c
1 quart cans 1.65
1 gallon cans 6.00

PERMATEX FORM-A-GASKET
¼ pint cans 35c
1 pint cans 1.00
1 quart cans 1.75

PERMATEX RADIATOR CEMENT
7 oz. cans 50c

PERMATEX NON-FREEZ-ENE
8 lb. cartons 1.50

PERMATEX CARBO-KLEAN
½ pint cans 50c
1 pint cans 85c

PERMATEX SOLVO-RUST
½ pint cans 50c
1 pint cans 85c

PERMATEX PRUSSIAN BLUE
½ x 4 tubes 15c
¾ x 4 tubes 20c

PERMATEX TAROFF
1 pint cans 85c

PERMATEX CLUTCH COMPOUND
1 pint cans 75c

PERMATEX NEVER-SQUEAK OIL
½ pint cans 35c
1 pint cans 60c

PERMATEX RAPID REPAIR BLACK
¼ pint cans 35c
½ pint cans 85c
1 pint cans 1.50

PERMATEX ANTI-STORM
1 pint cans 1.00
1 quart cans 1.75

PERMATEX ENGINE ENAMEL
¼ pint cans 20c
½ pint cans 50c
1 pint cans 85c

PERMATEX LAMP ENAMEL
½ pint cans 50c
1 pint cans 85c

PERMATEX FINISHING VARNISH
1 pint cans 1.10
1 quart cans 2.00
1 gallon cans 7.00

PERMATEX AUTO-LAC
½ pint Black 60c
1 pint Black 1.10
1 pint Colors 1.25

PERMATEX PAINTING OUTFITS
No. 1 Outfit 6.75
No. 2 Outfit 6.60

CONSTANT A. BENOIT
Manufacturer of Colors, Enamels, Varnishes, Cements
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Rayntite Fabrikoid Top material has made good. It is guaranteed not to leak for one year, but built to last the life of the car. Behind this guarantee stands a reputation, an integrity of purpose, and a financial responsibility universally recognized.

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World's Largest Manufacturers of Leather Substitutes

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Transparent, flexible, tough. Best suited for motor use. Employed by all leading manufacturers. No obligation in asking for full information.

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CEMENT, Radiator Repair (Continued)

O-K Auto Supply, Blackwell, Okla. "Check."
Panther—See B. A. T. Co.
Peerless Auto Specialty Corp., 188 St. Paul St., Rochester, N. Y.
Perma-Loc Mfg. Co., Scranton, Pa. (See page 495.)
Permatex—See Benoit, Constant A.
Permatite Mfg. Co., 67 Fifth Ave., N. E., Minneapolis, Minn. "E-Fec-Tiv."
Radi-No-Leak—See Crum Mfg. Co.
Rie-Nie—See Durkee-Atwood Co.
Se-Ment-Ol—See Northwestern Chemical Co.
Smooth-On Mfg. Co., Jersey City, N. J. (See page 341.)
Sta-Fix—See Auto Products Mfg. Co.
Stone Solder Co., 8107 Detroit Ave., Cleveland, O.
Stoppit—See Cumings Bros.
Sureseal Mfg. Co., 9 Centre St., Auburn, Me.
Universal Solder Co., Detroit, Mich.
Whiz—See Hollingshead Co.
Wonder Worker—See Hall-Thompson Co.
Woodworth Mfg. Corp., Niagara Falls, N. Y. (See page 721.)
"X" Laboratories, 630 Washington St., Boston, Mass.
Z & A Mfg. Co., Hazleton, N. Dak.

CEMENT, RUBBER—See Cement, Tire Repair

CEMENT, Tire Repair

(Rubber Cement for repairing or patching Shoes and Tubes; for cement for filling cuts in shoes—See Compounds, Tire Repair)

Acme Supply Co., Ionia, Mich.
American Rubber & Tire Co., 100 Beech St., Akron, O. "Stickfast."
Anchor—See National Cement & Rubber Co.
Arnstein, Eugene, 45 W. 26th St., Chicago, Ill.
Atlas Auto Supply Co., 697 W. Boston Ave., Chicago, Ill. "Tire-Doh." (See page 207.)
Bestyet—See St. Louis Rubber Cement Co.
Blue Ribbon Mfg. Co., 27 Baldwin St. (Charlestown), Boston, Mass. "Premium."
Continental Rubber Works, 1902 Liberty St., Erie, Pa. "Vitalic."
Cox, David H., 812 Chestnut St., Roselle, N. J.
Durkee-Atwood Co., Minneapolis, Minn. "Rie-Nie."
Dutch—See Van Cleef Bros.
Eclipse Cement & Blacking Co., 1238 Belmont Ave., Philadelphia, Pa.
Endurance Tire & Rubber Co., New Brunswick, N. J.
Eureka Cement Co., 2-6 Ave. A., Newark, N. J.
Ever Right—See Fry, Keyser.
Firestone Tire & Rubber Co., Miller & Sweitzer Aves., Akron, O.
Fry, Keyser, 616-22 N. Eighth St., Reading, Pa. "Ever Right."
General Tire & Rubber Co., E. Market St., Akron, O.
Goodrich Co., B. F., S. Main St., Akron, O. "Titan."
Goodyear Tire & Rubber Co., Akron, O. (See page 861.)
Hall-Thompson Co., Hartford, Conn. "Wonder Worker." (See page 739.)
Hazen-Brown Co., 430 Court St., Brockton, Mass. "Hazenoid."
Hazenoid—See Hazen-Brown Co.
Jackson-Eno Rubber Co., 1010 S. Main St., Los Angeles, Cal. "J. E."
J. E.—See Jackson-Eno Rubber Co.
M. & M. Mfg. Co., Lime & Western Aves., Akron, O.
Manhattan Rubber Mfg. Co., Willett St., Passaic, N. J.
Mattson Rubber Co., Lodi, N. J.
Michelin Tire Co., Milltown, N. J.
Miller, Chas. E., 1400 S. Meridian St., Anderson, Ind.
Miller Rubber Co., Dept. A 43, Akron, O. (See page 705.)
Nam-Tay—See Yatman Rubber Co.
Narco—See National Rubber Co.
National Cement & Rubber Co., 300-16 S. St. Clair St., Toledo, O. "Red Cross," "Anchor," "Pioneer."
National Chemical Co., Canal Fulton, O. "Quick Seal."
National Rubber Co., 4409 Papin St., St. Louis, Mo. "Narco."
P. P. & B.—See St. Louis Rubber Cement Co.
Pioneer—See National Cement & Rubber Co.
Portage Rubber Co., Barberton, O.
Premium—See Blue Ribbon Mfg. Co.
Quaker City Rubber Co., 629 Market St., Philadelphia, Pa.
Red Cross—See National Cement & Rubber Co.
Republic Rubber Co., Youngstown, O.
Rie-Nie—See Durkee-Atwood Co.
S-V—See Williams Mfg. Co.
St. Louis Rubber Cement Co., 3046 Lambdin Ave., St. Louis, Mo. "P. P. & B.," "Bestyet."
Stickfast—See American Rubber & Tire Co.
Stoppit—See Cumings Bros.
Tingley & Co., Chas. O., 21 St. Georges Ave., Rahway, N. J.
Tire-Doh—See Atlas Auto Supply Co.
Titan—See Goodrich Co.
United States Tire Co., Broadway & 58th St., New York, N. Y. (See page 695.)
Van Cleef Bros., 7709-11 Woodlawn Ave., Chicago, Ill. "Dutch."
Vitalic—See Continental Rubber Works.
Voorhees Rubber Mfg. Co., 18-46 Bostwick Ave., Jersey City, N. J.
Williams Mfg. Co., 18th & Carman Sts., Camden, N. J. "S-V."
Wonder Worker—See Hall-Thompson Co.
Yatman Rubber Co., 267-69 Mt. Pleasant Ave., Newark, N. J. "Nam-tay."

CEMENT, VULCANIZING—See Cement, Tire Repair

CENTER GAGES—See Gages, Center

CENTER PUNCHES—See Punches, Center Prick and Drift

CENTERING DRILLS—See Drills, Centering

CENTERING JIGS—See Jigs, Speedometer Gear Centering

CENTRIFUGALS, CLARIFYING AND FILTERING—See Separators, Oil

CHAIN BLOCKS—See Cranes, Portable

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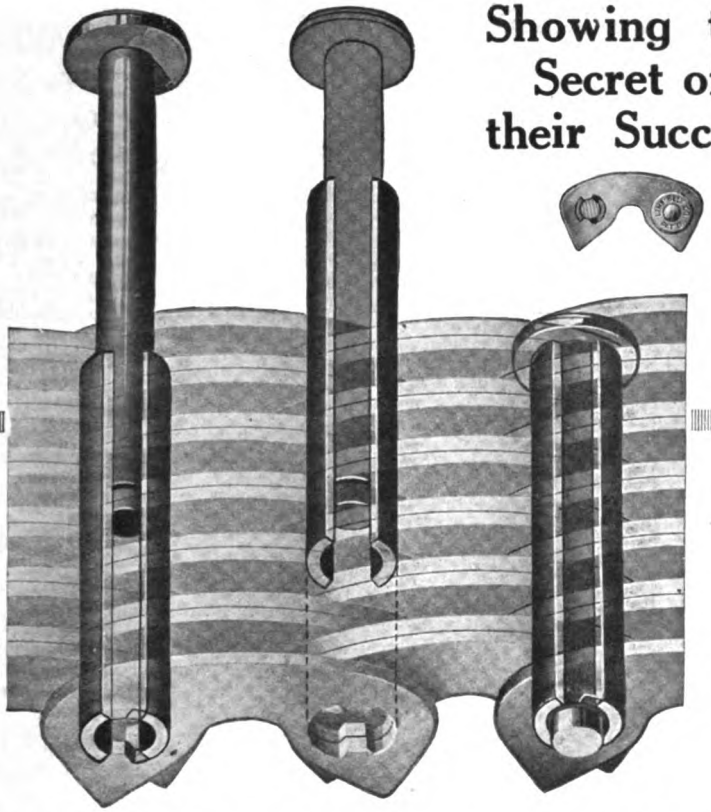
Link-Belt Silent Chain Drives

Showing the Secret of their Success



The life and efficiency of a silent chain drive depends almost entirely upon its joint construction. Look at the phantom view of the Link-Belt joint above. It differs from all other silent chains.

See how each link is protected against wear. Instead of the pin coming in direct contact with the links, it revolves between two case-hardened semi-circular bushings.

These bushings prevent the holes in the links from becoming elongated. And being of case-hardened steel, they are more durable than ordinary steel.

This Pin-Bushed-Joint construction is patented and is an exclusive feature of Link-Belt Silent Chain. It is responsible for the great success of Link-Belt Silent Chain Drives in automobile motors, where quiet operation and the highest degree of efficiency is so essential.

Learn more about this superior drive for automobile engines—watch its performance—see how carefully it is made—specify the Pin-Bushed-Joint silent chain for your next model.

We offer our services—gratis— in assisting designers and builders of automobile motors, on layouts involving the use of Silent Chain drives for all functions on automobile motors.

LINK-BELT COMPANY

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CHAIN, DRIVING—See Chain, Transmission

CHAIN, DRIVING FOR MOTORCYCLES—See Chain, Motorcycle Driving

CHAIN FASTENERS—See Fasteners, Tire Chain

CHAIN GUARDS—See Guards, Motorcycle Chain

CHAIN LUBRICANT—See Graphite; also Greases.

CHAIN, Motorcycle Driving

Baldwin Chain & Mfg. Co., Worcester, Mass. (See page 179.)

Diamond Chain & Mfg. Co., Kentucky Ave., Indianapolis, Ind.

Duckwall Chain & Mfg. Co., Springfield, Mass.

Frasse & Co., Peter A., 417 Canal St., New York, N. Y. (Importers.) "Hans Renold." (See page 657.)

Hans Renold—See Frasse & Co.

Presto—See Whitney Mfg. Co.

Whitney Mfg. Co., Hartford, Conn. "Presto." (See page 177.)

Chain Repair Links—See Links, Tire Chain Repair.

CHAIN SPRINGS — See Tighteners, Tire Chain

CHAIN TIGHTENERS — See Tighteners, Tire Chain

CHAIN TOOLS—See Tools, Chain Repair

CHAIN, Transmission or Driving

(Including Block, Roller and Silent Chain)

Abell Hardware Co., 332 Michigan Ave., Chicago, Ill. (Sole Distributors for American High Speed Chain Co., Indianapolis, Ind.)

American High Speed Chain Co.—See Abell Hardware Co.

Baldwin Chain & Mfg. Co., Worcester, Mass. (See page 179.)

Brampton—See Miller, Chas. E.

Coventry—See Funke Co.

Culver-Taylor Chain Works, 140 Madison Ave., Detroit, Mich.

Diamond Chain & Mfg. Co., Kentucky Ave., Indianapolis, Ind.

Frasse & Co., Peter A., 417 Canal St., New York, N. Y. (Importers.) "Renold" (See page 657.)

Funke Co., Herbert F. L., 118 Broad St., New York, N. Y. (Importers.) "Coventry." (See page 223.)

Link-Belt Co., 732 Dime Bank Bldg., Detroit, Mich. (See page 171.)

Miller, Chas. E., 97-103 Reade St. ,New York, N. Y. (Importer.) "Brampton."

Morse Chain Co., Ithaca, N. Y. (See page 175.)

Renold—See Frasse & Co.

Whitney Mfg. Co., Hartford, Conn. (See page 177.)

CHAINS or GRIPS, Non-Skid

(For other Anti-Skid Devices—See Bands, Non-Skid; also Boxes, Sand; also Treads, Detachable)

American Chain Co., Bridgeport, Conn. "Rido-Skid," "Weed." (See page 369.)

Andrews Heating Co., University & 28th Ave., Minneapolis, Minn.

Arrow-Grip Mfg. Co., Glens Falls, N. Y.

Auto Tire Boot Co., 1210 Webster Ave., Chicago, Ill.

Bay State Transportation Co., Fall River, Mass.

Brice Automatic Coupler Co., 1645 Hennepin Ave., Minneapolis, Minn.

Challoner Co., Oshkosh, Wis. "Giant." (See page 527.)

Cleveland Chain & Mfg. Co., Cleveland, O. "Trax-Yun."

Crew Levick Co., 111 N. Broad St., Philadelphia, Pa. "Unit."

Easyon—See Woodworth Mfg. Corp.

Emergency—See Gemco Mfg. Co.

Franklin Auto Shoe Co., Pendleton, Ind.

Fulton Co., 1910 St. Paul Ave., Milwaukee, Wis. (See page 139.)

Gemco Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. "Emergency." (See page 135.)

General Appliance Co., 19th St. & Western Ave., Chicago, Ill. "Jiffy."

Giant—See Challoner Co.

Goodhue, John, Laconia, N. H.

Grus Leaf-Spring Oiler Co., Chicago, Ill.

Hallock Engineering Co., 3107-09 Detroit Ave., Cleveland, O.

Herman Mfg. Co., 1420 Pennsylvania Ave., Washington, D. C.

Hill Insulating & Mfg. Corp., 511-13 W. 42d St., New York, N. Y. "Thorne." (See page 513.)

Hoover Co., W. H., New Berlin, O.

Imperial Bit & Snap Co., 14th & Clark Sts., Racine, Wis.

Jiffy—See General Appliance Co.

K-L—See Kingsbury-Leahy Co.

Kimball Tire Case Co., 163 Broadway, Council Bluffs, Ia.

Kingsbury-Leahy Co., Albany, N. Y. "K-L."

Krein Chain Co., Wapakoneta, O.

Leader Skid Chain Co., 4104 Manchester Ave., St. Louis, Mo.

McKinnon Chain Co., 250 Amherst St., Buffalo, N. Y.

Never-Skid Mfg. Co., 110 W. 14th St., New York, N. Y. (See page 183.)

Non Skid Co. of America, 9 Norwich St., Worcester, Mass.

Prest-O-Grip—See Rowe Calk & Chain Co.

Rido-Skid—See American Chain Co.

Rowe Calk & Chain Co., Plantsville, Conn. "Prest-O-Grip." (See page 173.)

Standley Skid Chain Co., Boone, Ia. (See page 229.)

Thorne—See Hill Insulating & Mfg. Corp.

Trax-Yun—See Cleveland Chain & Mfg. Co.

Unit—See Crew Levick Co.

Uptou Co., Curwensville, Pa.

Weed—See American Chain Co.

Woodworth Mfg. Corp., Niagara Falls, N. Y. "Easyon." (See page 721.)

CHAINS, TIRE—See Chains, Non-Skid

CHAINS, TOW—See Ropes or Chains, Tow

CHAIRS, FOLDING—See Seats, Supplementary

CHAMFERING MACHINES—See Machines, Gear Tooth Chamfering

CHANGERS, TIRE—See Machines, Tire Removing and Replacing

CHANNEL STEEL—See Steel, Angle

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Bogged!

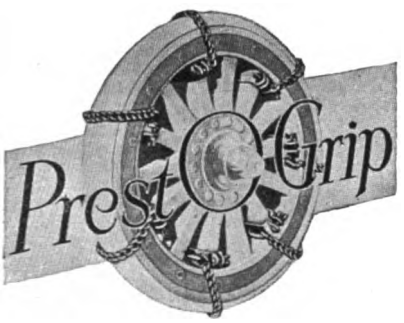
This driver wouldn't be jacking out his truck if he had on a set of Prest-O-Grips!

This driver wouldn't have to be jacking his truck out of this bottomless pit if he had on a set of

Prest-O-Grip

Anti-Skid Chains for Solid Tires

because Prest-O-Grips would give him the tractive power necessary to pull this heavy truck through the deepest mud or snow. They would also enable him to navigate safely the most slippery roads and streets without skidding. (Thus Prest-O-Grips perform the double function of giving increased traction and preventing skidding.)



PREST-O-GRIP CHAINS are *unit* cross chains, one chain to each alternate spoke, the chains being quickly attached to and detached from the rubber-lined clamps permanently attached to the spokes. The wear comes only on these cross chains.

Prest-O-Grips Anti-Skid Chains are "different" from ordinary anti-skid devices, and one of the reasons for this difference is the patented Prest-O-Grip Lock-Links used exclusively on Prest-O-Grip Chains. These lock-links keep the chains *securely locked* on the tires; they are guaranteed never to open accidentally—never to permit the chains to jump or fall off, as open hooks are likely to do.

THE PATENTED PREST-O-GRIP LOCK-LINKS are easy to snap on or off. They never rust. Your hands are the only tools necessary. Chains are attached in a few minutes wherever the truck happens to be—whether in the garage or on the road; whether on a smooth pavement or in deep snow or mud.

WE ARE PREPARED TO FURNISH PREST-O-GRIP EQUIPMENT FOR DISC WHEELS

Our No. 26 Clamp is standard equipment for attaching Prest-O-Grips to all disc wheels, except those used on Packard trucks—for which we furnish a special clamp.

For Trucks That Do Not Have the Necessary Clearance Between Brake Drum or Brake Mechanism and Felloe to Permit The Use of The Regular Spoke Clamp

we furnish our No. 33 Clamp, which is attached to the felloe of the wheel instead of the spoke.

New Prest-O-Grip Booklet. We have just issued an attractive booklet fully describing all of the Prest-O-Grip features. Every truck owner, jobber and dealer should have a copy.

DEALERS AND JOBBERS—Ask for our Co-operative Prest-O-Grip Proposition

The ROWE CALK & CHAIN COMPANY, Plantsville, Conn.

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CHANNELS, PRESSED STEEL — See Frames, Pressed Steel

CHARGERS, BATTERY — See Magnetos and Dynamos; also Dynamos, Battery Charging; also Rectifiers, Alternating Current; also Rheostats, Charging; also Systems, Electric Lighting

CHARGERS, MAGNETO MAGNET

(For remagnetising magneto magnets)

Benjamin Electric Mfg. Co., Chicago, Ill. "Little Giant." (See page 139.)

Electrical Equipment Co., 1152 S. Grant Ave., Los Angeles, Cal.

Little Giant—See Benjamin Electric Mfg. Co.

Metzger-Daniels Co., 160 N. Fifth Ave., Chicago, Ill.

Midway Mechanical Co., 1555 Selby Ave., St. Paul, Minn.

Morgan, C. W., 1336 Michigan Ave., Chicago, Ill.

Phillips Engineering Co., S. Perry St., Dayton, O. "Teco."

Quality—See Sypher Tool Mfg. Co.

St. Louis Electrical Works, 4057 Forest Park Blvd., St. Louis, Mo. (See page 269.)

Sypher Tool Mfg. Co., 2274 Warren St., Toledo, O. "Quality."

Teco—See Phillips Engineering Co.

Teco—See Titan Engineering Co.

Titan Engineering Co., Union City, Ind. "Teco."

CHARGERS, Magneto Magnet, for Fords

(For remagnetising magneto magnets)

Benjamin Electric Mfg. Co., Chicago, Ill. (See page 139.)

Berkshire Magneto Co., Fourth St., Pittsfield, Mass.

Kingston—See Kokomo Electric Co.

Kokomo Electric Co., 1415 Webster St., Kokomo, Ind. "Kingston."

Midway Mechanical Co., 1555 Selby Ave., St. Paul, Minn.

Quality—See Sypher Tool Mfg. Co.

Sypher Tool Mfg. Co., 2274 Warren St., Toledo, O. "Quality."

CHARGING APPARATUS—See Dynamos; also Ammeters; also Panels; also Plugs; also Rectifiers; also Rheostats

CHART HOLDERS, AIRCRAFT — See Holders, Aircraft Chart

CHARTS, Electrical Trouble

(To aid in locating electrical troubles)

Ambu—See American Bureau of Engineering.

American Bureau of Engineering, 1018 S. Wabash Ave., Chicago, Ill. "Ambu." (See page 855.)

CHASSIS ADAPTERS — See Converters, Chassis

CHASSIS, Complete

Norwalk Motor Car Co., Martinsburg, W. Va.

Reed & Glaser, Merchants Bank Bldg., Indianapolis, Ind.

CHASSIS CONVERTERS—See Converters, Chassis

CHAUFFEUR'S TELEPHONES—See Telephones, Limousine

CHECK VALVES—See Valves, Angle; also Valves, Ball Check

CHECK VALVES, MOTOR BOAT ENGINE —See Valves, Motor Boat Check

CHECKS, Brass, Time, Tool and Pay

Matthews & Co., Jas. H., Pennant Way, Pittsburgh, Pa.

CHECKS, Clutch

Schooler Co., O. E., Webb City, Mo.

CHECKS, PAY—See Checks, Brass Time

CHECKS, Steering Gear

(Spring or friction attachments for steering gear to eliminate sideway and reduce the shock transmitted to the steering wheel by the road wheels)

Cooper Auto Supply Co., N. Broad St., Thomasville, Ga.

F. M. F.—See Sav-A-Life Fender Co.

Little Steersman—See Modern Auto Appliance Co.

Meixell Co., Merchants Bank Bldg., Indianapolis, Ind.

Modern Auto Appliance Co., Chatham, N. Y. "Little Steersman."

Sav-A-Life Fender Co., Society for Savings Bldg., Cleveland, O. "F. M. F."

CHECKS, Steering Gear, for Fords

(Spring or friction attachments for steering gear to eliminate sideway and reduce the shock transmitted to the steering wheel by the road wheels)

American Automobile Accessories Co., B. & O. R. R. & Blue Rock St., Cincinnati, O. "Litl Sho Fur."

Badger—See Safety Appliance Co.

Bailey Co., W. J., Newark, N. J.

Bayne Mfg. Co., Grant & Davis Sts., Bushnell, Ill. "Pilot."

Bunker Sales Co., Glendale Bldg., Kansas City, Mo.

Comfort Motor Machine Co., 715 Galapago St., Denver, Colo.

Cooper Auto Supply Co., N. Broad St., Thomasville, Ga.

Cox Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y.

Danvers Specialty Co., Danvers, Ill.

Drive-Rite—See Economy Gas Lamp Co.

Economy Gas Lamp Co., 215-17 Goodrich Pl., Kansas City, Mo. "Drive-Rite."

Fernald Mfg. Co., North East, Pa. "Steer-Aid."

General Appliance Co., 19th St. & Western Ave., Chicago, Ill.

Hanten Machine Co., Watertown, S. Dak. (See page 461.)

Harrington Co., O. C., 341 N. Crawford Ave., Chicago, Ill.

Hastings Mfg. Co., Hastings, Mich.

Helco—See Homestead Engineering Laboratories Co.

Homestead Engineering Laboratories Co., Homestead, Pa. "Helco."

Ideal Mfg. Co., 14th & Harrison Sts., North Kansas City, Mo.

Ideal Mfg. Co., 1525 Main St., Anderson, Ind.

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WHY worry and fret about noisy front ends?

WHY have your production tied up by your inspectors turning down cars for noisy front ends?

WHY send so many crank cases and gears to the scrap pile on account of the impractical tolerances necessary for gearing?

WHY maintain a separate department for changing gears?

WHY have your dealer complain of nine out of every ten cars being noisy?

SOME concerns started to avoid this unpleasant experience in 1912 and have continued to do so ever since. Each year other concerns have fallen in line without one of them going back to the old form of drive.

IT is only a matter of time until all cars will be equipped with MORSE silent chains for driving the cam and accessory shafts.

FIND out more about the new MORSE No. 28 white chain.

MORSE CHAIN CO. Gen'l Office and Works: Ithaca, N.Y.

Largest Manufacturers of Silent Chains in the World

Detroit Sales Office and Display Rooms,
1003 Woodward Avenue

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CHECKS, Steering Gear, for Fords (Continued)

K-L-K—See Kickhaefer Mfg. Co.
Kickhaefer Mfg. Co., 199-201 Oregon St., Milwaukee, Wis. "K-L-K." (See page 785.)
Lincoln Steering Device Co., 1535 P. St., Lincoln, Neb. "Lincoln."
Liti Sho Fur—See American Automobile Accessories Co.
Little Steersman—See Modern Auto Appliance Co.
Lockwood-Ash Motor Co., 1801 Horton St., Jackson, Mich. "L-A."
Mazura Mfg. Co., 414 S. Sixth St., St. Louis, Mo.
Meixell Co., Merchants Bank Bldg., Indianapolis, Ind.
Miller & Co., Spring Valley, Ill.
Modern Auto Appliance Co., Chatham, N. Y. "Little Steersman."
Perfek Device Co., 2105-07 E. 15th St., Kansas City, Mo.
Petersburg Specialty Co., Petersburg, Ill.
Phelps, L. J., 3136 Homer St., Loma Portal, Cal.
Philadelphia Auto Safety Steering Device Co., 1022 Arch St., Philadelphia, Pa.
Pilot—See Bayne Mfg. Co.
Round Robbin—See V Air Valve & Mfg. Co.
Rounds & Co., C. C., Dows, Ia.
Safety Appliance Co., 515-17 Broadway, Baraboo, Wis. "Badger."
Savidge Co., 611 N. Capitol Ave., Indianapolis, Ind.
Steer-Aid—See Fernald Mfg. Co.
Steer-Ezer—See Walker Mfg. Co.
Twin-Rim Co., Everett, Mass.
V Air Valve & Mfg. Co., 1648 Tremont St., Denver, Colo. "Round Robbin."
Walker Mfg. Co., Hamilton & Michigan Sts., Racine, Wis. "Steer-Ezer."

CHECKS, TIME—See Checks, Brass Time

CHECKS, TOOL—See Checks, Brass Time

CHEMICAL FIRE TANKS—See Tanks, Chemical Fire

CHEMICAL PLATING COMPOUNDS—See Compounds, Chemical Plating

CHIMES, EXHAUST—See Horns, Exhaust

CHISELS, CAPE—See Chisels, Cold and Cape

CHISELS, Cold and Cape

Atha Tool Co., Chapel St., Newark, N. J.
Beall Bros., Fourth St., Alton, Ill.
Billings & Spencer Co., Laurel & Park Sts., Hartford, Conn.
Braunsdorf-Mueller Co., 205 Madison St., Elizabeth, N. J.
Buck Bros., Milbury, Mass.
Buffum Tool Co., Louisiana, Mo. (See page 707.)
Carver Tool Works, Spring Valley, N. Y.
Cincinnati Tool Co., 1951 Waverly Ave., Norwood, O. "Hargrave."
Cronk & Carrier Mfg. Co., Second National Bank Bldg., Elmira, N. Y.
Cushman Auto Tool Co., Nell & Green Sts., Champaign, Ill.
Drew & Co., C., Kingston, Mass.
Evansville Tool Works, Ninth Ave. & Maryland St., Evansville, Ind.
Fairmount Tool & Forging Co., 10585 Quincy Ave., Cleveland, O.
Hargrave—See Cincinnati Tool Co.
Hubbard & Co., 62d St. & A. V. R. R., Pittsburgh, Pa.
K. & B.—See Kilborn & Bishop Co.
Kilborn & Bishop Co., Chapel & Lloyd Sts., New Haven, Conn. "Silex," "K. & B."
Klein-Logan Co., S. 13th & Breed Sts., Pittsburgh, Pa.
Kortick Falls Mfg. Co., San Francisco, Cal.
Kraeuter & Co., 571-85 18th Ave., Newark, N. J.
Lowentraut Mfg. Co., P., 36-54 Brenner St., Newark, N. J.
Marcy Tool Works, Putnam, Conn.
Maydole Hammer Co., David, 45-61 Lackawanna Ave., Norwich, N. Y.
Milwaukee Tool & Forge Co., 220 Becher St., Milwaukee, Wis.
Mound Tool Co., Dept. D., Seventh & Hickory Sts., St. Louis, Mo. (See page 789.)
Ohio Tool Co., Charleston, W. Va.
Peck, Stow & Wilcox Co., Southington, Conn. "Pexto."
Pexto—See Peck, Stow & Wilcox Co.
Red Head—See S. & I. Co.
S. & I. Co., 55-57 Governor St., Springfield, Mass. "Red Head."
Sharpenezey—See Smith & Co.
Silex—See Kilborn & Bishop Co.
Smith & Co., H. D., Plantsville, Conn. "Sharpenezy."
Snell Mfg. Co., Fiskdale, Mass.
Stortz & Son, John, 210-12 Vine St., Philadelphia, Pa.
Syracuse Twist Drill Co., 936 Grape St., Syracuse, N. Y.
Tuck Mfg. Co., 74 Ames St., Brockton, Mass.
Vaughan & Bushnell Mfg. Co., 2114-38 Carroll Ave., Chicago, Ill.
Verona Tool Works, Oliver Bldg., Pittsburgh, Pa.
Vichek Tool Co., 10709 Quincy Ave., Cleveland, O.
Warner Hammer Co., Cromwell, Conn.

CHOCKS, Blocks and Clamps, Car Shipping

Rohe Traction Block Co., First Ave. N. & Third St., Kenmare, N. D.

CHROME NICKEL STEEL—See Steel, Chrome Nickel

CHUCKING GRINDERS—See Grinders, Chucking

CHUCKS, Boring Mill

Gisholt Machine Co., 1815 E. Washington Ave., Madison, Wis.
Horton & Son Co., E., Windsor Locks, Conn.
Union Mfg. Co., 296 Church St., New Britain, Conn.
Westcott Chuck Co., Oneida, N. Y.

CHUCKS, Drill

Almond Mfg. Co., T. R., 1 Maple Ave., Ashburnham, Mass.
Cushman Chuck Co., 806 Windsor St., Hartford, Conn.

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TRANSMISSION CHAINS

Equip your Motor Trucks and Tractors with "Whitney" Chains

Now that the motor truck is handling so much of the freight that was formerly cared for by the railroads, it must run on a schedule almost as exacting as that of the railroad train itself. This emphasizes the necessity of selecting a chain which can be relied on under all conditions of speed, road, and weather.

The "Whitney" Type of Cotter Detachable Roller Chain has made a record for convenience and efficiency which NO OTHER TYPE HAS APPROACHED, especially under the exacting conditions of MOTOR VEHICLE SERVICE.

Our years of experience in chain making, our selection of only the best materials, our special processes of manufacture, and our rigid system of inspection, all combine to make "Whitney" chains the leaders in their line.

THE WHITNEY MFG. CO.

HARTFORD, CONN.

CHAINS KEYS AND CUTTERS HAND MILLING MACHINES

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CHUCKS, Drill (Continued)

Detroit Twist Drill Co., Detroit, Mich. "Graham." (See page 259.)

Goodell Mfg. Co., Greenfield, Mass. "Greenfield."

Goodell-Pratt Co., Greenfield, Mass. (See page 751.)

Graham—See Detroit Twist Drill Co.

Greenfield—See Goodell Mfg. Co.

Horton & Son Co., E., Windsor Locks, Conn. "Morrow."

Jacobs Mfg. Co., 32 Union Pl., Hartford, Conn

Little Giant—See Westcott Chuck Co.

McCrosky Reamer Co., S. Main St., Meadville, Pa. "Wizard."

Magic—See Modern Tool Co.

Millers Falls Co., Millers Falls, Mass.

Modern Tool Co., Fourth & State Sts., Erie, Pa. "Magic."

Morrow—See Horton & Son Co.

Morse Twist Drill & Machine Co., New Bedford, Mass.

National—See Oneida National Chuck Co.

New Britain—See Union Mfg. Co.

Oneida—See Westcott Chuck Co.

Oneida National Chuck Co., Oneida, N. Y. "National."

Pratt Chuck Co., Frankfort, N. Y.

Presto—See Whitney Mfg. Co.

Skinner Chuck Co., Church & Stanley Sts., New Britain, Conn.

Standard Tool Co., 6900-34 Central Ave., Cleveland, O.

Trump Bros. Machine Co., Beach & Anchorage Sts., Wilmington, Del.

Union Mfg. Co., 296 Church St., New Britain, Conn. "New Britain."

Wahlstrom Tool Co., 5520 Second Ave., Brooklyn, N. Y.

Weaver Mfg. Co., 2173 S. Ninth St., Springfield, Ill.

Westcott Chuck Co., Oneida, N. Y. "Little Giant," "Oneida."

Whitney Mfg. Co., Hartford, Conn. "Presto." (See page 177.)

Whiton Machine Co., D. E., 190 Howard St., New London, Conn.

Wizard—See McCrosky Reamer Co.

CHUCKS, Lathe

Almond Mfg. Co., T. R., 1 Maple Ave., Ashburnham, Mass.

American Tool & Machine Co., Boston, Mass.

Barker—See Thomas Elevator Co.

Cushman Chuck Co., 806 Windsor St., Hartford, Conn.

Gisholt Machine Co., 1315 E. Washington Ave., Madison, Wis.

Hoggson & Pettis Mfg. Co., New Haven, Conn. "Sweetland."

Horton & Son Co., E., Windsor Locks, Conn.

Oneida National Chuck Co., Oneida, N. Y.

Skinner Chuck Co., Church & Stanley Sts., New Britain, Conn.

Sweetland—See Hoggson & Pettis Mfg. Co.

Thomas Elevator Co., 20 S. Hoyne Ave., Chicago, Ill. "Barker."

Union Mfg. Co., 296 Church St., New Britain, Conn.

Westcott Chuck Co., Oneida, N. Y.

Whiton Machine Co., D. E., 190 Howard St., New London, Conn.

CHUCKS, Magnetic

D. & W. Fuse Co., Providence, R. I.

Heald Machine Co., 22 New Bond St., Worcester, Mass.

Simmons—See Taft-Peirce.

Taft-Peirce, Woonsocket, R. I. "Simmons." (See page 595.)

CHUCKS, Milling Machine

Horton & Son Co., E., Windsor Locks, Conn.

Oneida National Chuck Co., Oneida, N. Y.

Skinner Chuck Co., Church & Stanley Sts., New Britain, Conn.

Westcott Chuck Co., Oneida, N. Y.

CHUCKS, Planer

Bartlett, Edwin E., 41 Crown St., Nashua, N. H.

Horton & Son Co., E., Windsor Locks, Conn.

Skinner Chuck Co., Church & Stanley Sts., New Britain, Conn.

Union Mfg. Co., 296 Church St., New Britain, Conn.

CHUCKS, Pneumatic

Aerochuck—See Manufacturers Equipment Co.

Manufacturers Equipment Co., 169 N. Jefferson St., Chicago, Ill. "Aerochuck."

CHUCKS, Screw Machine

Horton & Son Co., E., Windsor Locks, Conn.

Oneida National Chuck Co., Oneida, N. Y.

CIGAR LIGHTERS—See Lighters, Electric, Cigar

CIRCLE CUTTERS—See Cutters, Washer or Gasket

CIRCUIT TESTING INSTRUMENTS—See Instruments, Electrical Circuit Testing

CIRCULAR GLASS CUTTERS—See Cutters, Circular Glass

CIRCULATING PUMPS — See Pumps, Water

CIRCULATION GAGES—See Gages, Water Circulation

CIRCULATION REGULATORS—See Regulators, Water Circulating

CLAMPS, BODY BUILDERS—See Clamps, Woodworkers

CLAMPS, BOW—See Holders, Top

CLAMPS, BOW, FOR FORDS—See Clamps, Top Bow

CLAMPS, CAR SHIPPING—See Chocks, Car Shipping

CLAMPS OR FASTENERS, HOOD—See Fasteners, Hood

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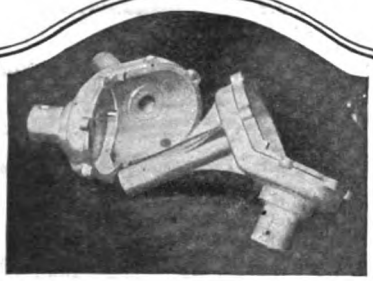

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Physically PERFECT

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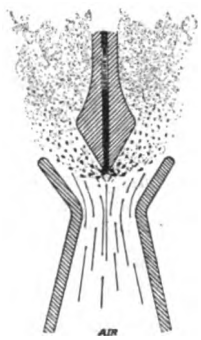
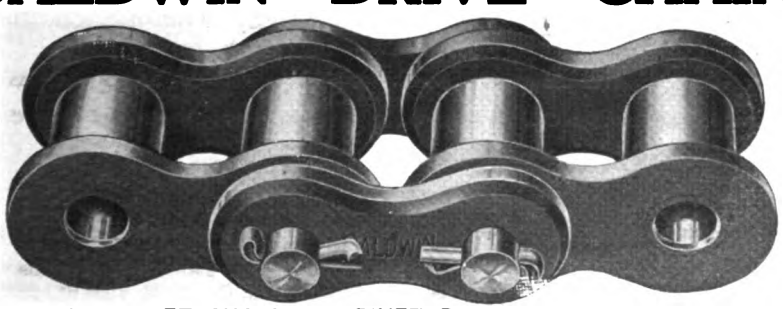


AIR UPWARD

TO BREAK A THING HIT IT THAT'S WHAT WE DO

Inverted Jet Carburetor Co.
DETROIT, MICH.
611-615 Fort St., West

BALDWIN DRIVE CHAINS



are made both DETACHABLE and RIVETED.

The high quality of material and workmanship enables us to produce chains of superior strength and durability, especially for agricultural tractors and heavy trucks. Send for samples.

We are prepared to quote interesting prices on Sprockets for sample lots or in quantity. Write us.

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WORCESTER, MASS.

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W. D. FOREMAN, 1607 Prairie Ave., Chicago, Ill.
M. & M. CO., Cleveland, Ohio.
NEUSTADT AUTOMOBILE & SUPPLY CO., St. Louis, Mo.
MOTOR & MACHINISTS' SUPPLY CO., Kansas City, Mo.
C. J. SMITH & CO., St. Paul, Minn.
M. A. BRYTE, Inc., 543 Golden Gate Ave., San Francisco, Cal.
LYMAN TUBE & SUPPLY CO., Ltd., Montreal, Toronto, Can.
J. M. HOWE, 245 Plymouth Bldg., Minneapolis, Minn.
WIRTHLIN-MANN CO., 318 West Third St., Cincinnati, Ohio.
H. V. GREENWOOD, 122 S. Michigan Ave., Chicago, Ill. (General Western Representative).

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CLAMPS or Fasteners, Hood, for Fords

(For fastening down hoods—See also Anti-Rattlers, Hood)

Monarch Carriage Goods Co., 2838-44 Spring Grove Ave., Cincinnati, O.
Nelson Mfg. Co., A., 2700 Southport Ave., Chicago, Ill.

CLAMPS, Hose

(For Radiator Hose or Tire Pump Tubing)

American Stamping Co., Battle Creek, Mich.
Bartlett Mfg. Co., 40 E. Lafayette Ave., Detroit, Mich. "Bellamy."
Beaudette & Co., R. A., Chippewa Falls, Wis. "R. A. B."
Bellamy—See Bartlett Mfg. Co.
Bull Dog—See Oliver Metal Stamping Co.
Catelain, Andrae, 1446-48 Indiana Ave., Chicago, Ill.
Cooper—See Otis-Flagg Corp.
Crabill Hose Clamp Co., 310 Hamlin St., Battle Creek, Mich.
Elk Mfg. Co., 1926 Broadway, New York, N. Y.
Elkin Hose Clamp Co., 64 Dey St., New York, N. Y.
Esco—See Stevens & Co.
Faw J. H., 37 Warren St., New York, N.Y. (Eastern and Southern Distributors for Ideal Clamps.) (See page 387.)
Federal Tin Co., Charles & Barre Sts., Baltimore, Md.
Fitzgerald Mfg. Co., Railroad Ave., Torrington, Conn. (See page 309.)
Globe Machine & Stamping Co., 1250 W. 76th St., Cleveland, O.
Harrisburg Stamping Co., Sixth & Cumberland Sts., Harrisburg, Pa. "Lightning."
Ideal Clamp Mfg. Co., 200-02 Bradford St., Brooklyn, N. Y. (See page 195.)
Lasso—See Pro-Mo-Tor.
Lightning—See Harrisburg Stamping Co.
Morgan Mfg. Co., Keene, N. H.
Nelson Mfg. Co., A., 2700 Southport Ave., Chicago, Ill.
Newark Stamping & Foundry Co., Newark, O. "Thompson."
Oliver Metal Stamping Co., 217-23 W. Illinois St., Chicago, Ill. "Bull Dog."
Otis-Flagg Corp., 456 Fourth Ave., New York, N. Y. "Cooper."
Pro-Mo-Tor, 245 W. 55th St., New York, N. Y. "Lasso." (See page 513.)
R. A. B.—See Beaudette & Co.
Schrader's Son, A., 783-91 Atlantic Ave., Brooklyn, N. Y. (See page 331.)
Sherman Mfg. Co., H. B., 12 Barney St., Battle Creek, Mich.
Stevens & Co., 375 Broadway, New York, N. Y. "Esco."
Thompson—See Newark Stamping & Foundry Co.
Universal Industrial Corp., Main St., Hackensack, N. J.
Yerdon, Wm., Main & Center Sts., Fort Plain, N. Y.

CLAMPS, Machinists

Athol Machine Co., Athol, Mass.
Billings & Spencer Co., Laurel & Park Sts., Hartford, Conn.
Brown & Sharpe Mfg. Co., Promenade St., Providence, R. I.
Cincinnati Tool Co., 1951 Waverly Ave., Norwood, O. "Hargrave."
Fort Dearborn Mfg. Co., Sterling, Ill.
Goodell-Pratt Co., Greenfield, Mass. (See page 751.)
Hargrave—See Cincinnati Tool Co.
Le Count, Wm. G., Merritt St., South Norwalk, Conn.
Mark Mfg. Co., Chicago, Ill.
Pawtucket Mfg. Co., 327 Pine St., Pawtucket, R. I.
Phoenix Hardware Co., 49-53 Illinois St., Buffalo, N. Y.
Starrett Co., L. S., Athol, Mass.
Taylor Mfg. Co., James L., Parker Ave., Poughkeepsie, N. Y.
Williams & Co., J. H., 38 Richards St., Brooklyn, N. Y. (See page 433.)

CLAMPS, ROPE—See Clamps, Wire Rope

CLAMPS, Spring Repair

(For the temporary repair of broken leaf springs)

Buckeye—See Central Brass & Fixture Co.
Central Brass & Fixture Co., Dept. A., Springfield, O. "Buckeye." (See page 137.)
Kantalever—See Motor Car Equipment Co.
Motor Car Equipment Co., 21 W. 62d St., New York, N. Y. "Kantalever."

CLAMPS, TOP BOW—See Holders, Top

CLAMPS, Top Bow, for Fords

(To take the place of the straps to hold down top)

Apco Mfg. Co., Eddy St., Providence, R. I.
Mosco—See Motor Specialties Co.
Motor Specialties Co., Pine St., Waltham, Mass. "Mosco."
Nelson Mfg. Co., A., 2700 Southport Ave., Chicago, Ill.

CLAMPS, Transmission Band Assembling, for Fords

Mechanics Tool Co., 1409 Kansas Ave., Kansas City, Mo. "Never-Slip."
Never-Slip—See Mechanics Tool Co.

CLAMPS, Wire Rope

(For Brake Cables)

Broderick & Bascom Rope Co., 817 N. Second St., St. Louis, Mo.
Bull Dog—See Lamson & Sessions Co.
Hazard Mfg. Co., 81 E. Ross St., Wilkes-Barre, Pa.
Lamson & Sessions Co., 2188 Scranton Rd., Cleveland, O. "Bull Dog."
Lanz & Sons, Mathew, 2907 Carson St., Pittsburgh, Pa.
Leschen & Sons Rope Co., A., 920 N. First St., St. Louis, Mo.
Macomber & Whyte Rope Co., 507-09 S. Clinton St., Chicago, Ill.
Roebling's Sons Co., John A., S. Broad & Canal Sts., Trenton, N. J.
Trenton Iron Co., Trenton, N. J.
Union Elevator & Machine Co., 227 W. Erie St., Chicago, Ill.
Wilcox, Crittenden & Co., 33 Main St., Middletown, Conn.

CLAMPS, Woodworkers

Aldrich Co., Wm. K., 4 Grove St., Lowell, Mass.

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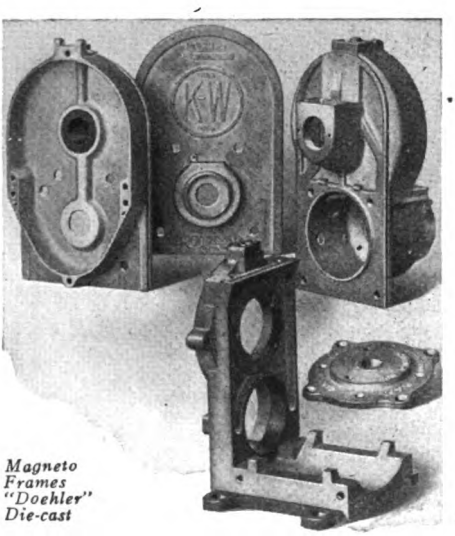
DOEHLER DIE-CASTINGS

have attained their supremacy by the unvarying excellence of their QUALITY and the unfailing reliability of the SERVICE behind them.

In the automobile and accessory fields and, in fact, wherever die-castings are used—Doehler Die-Castings are the STANDARD of comparison.

The acknowledged prestige of the Doehler organization is the guarantee of a product of uniform excellence and correct to the minutest detail.

The enormous output of our three large plants permits of advantages to users of die-castings —as regards PRICE, QUALITY and SERVICE not otherwise possible.



Magneto Frames "Doehler" Die-cast

That these facts are generally recognized is evidenced by the prominence of the extensive and CONSISTENT users of Doehler Die-Castings.

DOEHLER DIE-CASTING CO.

MAIN OFFICE AND EASTERN PLANT
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WESTERN PLANT
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NEW JERSEY PLANT
NEWARK, N.J.

Die-Castings in BRASS and BRONZE, Aluminum and White Metal Alloys. Die-Cast Babbitt and Babbitt-Lined Bronze Bearings.

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CLAMPS, Woodworkers (Continued)

Batavia Clamp Co., 37 Center St., Batavia, N. Y. "Colts."
Bay State—See Cutter, Geo. A.
Buffalo—See Josef Mfg. Co.
Chapin-Stephens Co., Pine Meadow, Conn.
Cincinnati Tool Co., 1951 Waverly Ave., Norwood, O. "Hargrave."
Colts—See Batavia Clamp Co.
Cutter, Geo. A., Taunton, Mass. "Bay State."
Dann Bros. & Co., 80-88 Franklin St., New Haven, Conn.
Detroit Screw Works, 368 Franklin St., Detroit, Mich. "Reno."
Eagle—See Woodruff & Sons Co.
Eberhard Mfg. Co., 2734 Tennyson Rd., Cleveland, O.
Erie Metal Products Co., Erie, Pa. "Thompson." (See page 523.)
Grand Rapids Hand Screw Co., 950 N. Front St., Grand Rapids, Mich.
Hammer & Co., Branford, Conn.
Hargrave—See Cincinnati Tool Co.
Josef Mfg. Co., Chicago, Ill.
Mark Mfg. Co., Chicago, Ill.
Mount Carmel—See Woodruff & Sons Co.
National Novelty Corp., New York, N. Y.
O'Neil, Jr., J. H., Pawtucket, R. I.
Ohio Tool Co., Charleston, W. Va.
Oliver Machinery Co., Coldbrook & Clancy Sts., Grand Rapids, Mich.
Palmer & Sons, Albert E., John & Bradley Sts., Owosso, Mich.
Peck, Stow & Wilcox Co., Southington, Conn. "Pexto."
Pexto—See Peck, Stow & Wilcox Co.
Phoenix Hardware Co., 49-53 Illinois St., Buffalo, N. Y.
Reno—See Detroit Screw Works.
Taylor Mfg. Co., James L., Parker Ave., Poughkeepsie, N. Y.
Thompson—See Erie Metal Products Co.
Williams & Co., J. H., 38 Richards St., Brooklyn, N. Y. (See page 433.)
Woodruff & Sons Co., Walter W., Mount Carmel, Conn. "Eagle," "Mount Carmel."

CLARIFIERS, OIL—See Separators, Oil

CLEANERS, Acetylene Burner

Barnard Specialty Co., 3300 Maple Ave., Los Angeles, Cal.
Edelmann & Co., E., 341-63 E. Ohio St., Chicago, Ill.
Nelson Mfg. Co., A., 2700 Southport Ave., Chicago, Ill.

CLEANERS, Air

(Device to attach to air intake of carbureters to remove sand and dust from the entering air)

Bennett—See Wilcox-Bennett Carburetter Co.
Holley Kerosene Carburetor Co., 145-47 Willis Ave., E., Detroit, Mich.
Leonard Air Washer Co., Hanselman Bldg., Kalamazoo, Mich.
Orem Motor Protector Co., Maryland Trust Bldg., Baltimore, Md.
Wilcox-Bennett Carburetter Co., 1030 Marshall St., N. E., Minneapolis, Minn. "Bennett."

CLEANERS, BURNER—See Cleaners, Acetylene Burner

CLEANERS, Engine

(For cleaning oil and grease from engines and chassis by a compressed air and gasoline or kerosene spray)

Binks—See Star Brass Works.
Bishop-Babcock-Becker Co., E. 49th St. & Hamilton Ave., Cleveland, O.
Branford—See Malleable Iron Fittings Co.
Cleveland Faucet Co., 708 Frankfort Ave., N. W., Cleveland, O.
Codman & Shurtleff, 120 Boylston St., Boston Mass.
Daniels Mfg. Co., Atchison, Kans.
Lipman Air Appliance Co., 206 Pleasant St., Beloit, Wis. "Onceover."
Malleable Iron Fittings Co., Branford, Conn. "Branford."
Onceover—See Lipman Air Appliance Co.
Romort Mfg. Co.—See Zinke Co.
Star Brass Works, 319 N. Albany Ave., Chicago, Ill. "Binks."
Turner Brass Works, Sycamore, Ill.
Wagner Specialty Co., 1902 Broadway, New York, N. Y.
Zinke Co., 1323-25 Michigan Ave., Chicago, Ill. (Sole Distributors for Romort Mfg. Co., Oakfield, Wis.) (See pages 548 and 549.)

CLEANERS, Fabric

(Compounds for cleaning upholstery or slip covers; for vacuum cleaners—See Cleaners, Vacuum)

Percama—See Perkins-Campbell Co.
Perkins-Campbell Co., 634 Broadway, Cincinnati, O. "Percama." (See page 227.)

CLEANERS, Glass Wind Shield

(For cleaning wind shield glass of snow or rain; for chemical cleaners or preventatives—See Compounds, Glass Wind Shield)

Alcemo Mfg. Co., 120 Bridge St., Newark, N. J. "Klearsight." (See page 183.)
Auto Scope—See White Lock Co.
Automobile Devices Co., Real Estate Trust Bldg., Philadelphia, Pa. "Burke."
Bridgwood Mfg. Co., Charlotte A., 9 E. Eighth St., New York, N. Y.
Burke—See Automobile Devices Co.
Clean-All Windshield Corp., 257 Washington St., Buffalo, N. Y.
Clear-O-Scope—See Indiana Specialty Mfg. Co.
Clearview—See Windshield Cleaner Device Co.
Evergood—See Grossman Mfg. Corp.
Gabriel Mfg. Co., 1407 40th St., N. E., Cleveland, O.
Grossman Mfg. Corp., Emil, Bush Terminal Bldg. No. 20, Brooklyn, N. Y. "Evergood."
Hartenstein, R. P., 542 S. Dearborn St., Chicago, Ill. "Utility."
Indiana Specialty Mfg. Co., Angola, Ind. "Clear-O-Scope."
J. T. Auto Device Co., 5810 Euclid Ave., Cleveland, O. (See page 183.)
Klearsight—See Alcemo Mfg. Co.
Marvel Accessories Mfg. Co., 2011 E. 46th St., Cleveland, O. (See page 763.)
Nagel Electric Co., W. G., 28-32 St. Clair St., Toledo, O.
Outlook Co., 5527 Euclid Ave., Cleveland, O.
See Safe—See Stadeker Metal Specialty Co.

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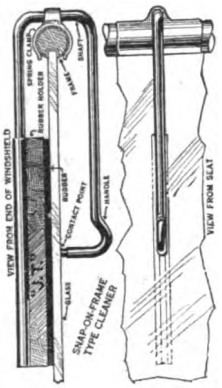
"An all year around necessity"

Here is an auto device that should be on every car in America — that means a possible market for over "four million" of these windshield cleaners. They are just as vitally needed for safe driving in Summer as they are in Winter.



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J. T. AUTO DEVICE CO.
5810 Euclid Ave., Cleveland, Ohio

NEVER-SKID

TRUCK
TRACTION
TREADS

FOR DUAL TIRES

Give positive traction without vibration.

Steel treads practically armour tires.

Saving in rubber alone will pay for NEVER-SKID TRUCK TRACTION TREADS in one season.

Illustrated folder and price list on request.

NEVER-SKID MANUFACTURING COMPANY
110 West 14th St., New York

Kor-Ker

TIRE TREATMENT

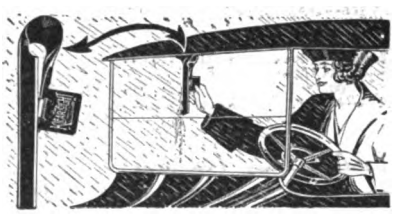
KOR-KER tire treatment **preserves rubber**—positively beneficial. Not a filler. **Seals punctures—stops slow leaks**—reduces blowouts to a minimum. Maintains normal inflation. These are absolute facts which can be verified.

KOR-KER is a compound boxed in powder form. Mixed with water, is readily installed through valve stem. KOR-KER is forced into the puncture by the air pressure, compressed into a cement plug and becomes part of the tube. Same action occurs in sealing slow leaks.

3 or 3½" tires $8.00 for set 4 tires
4 or 4½" tires $10.00 for set 4 tires
5 or 5½" tires $14.00 for set 4 tires

Price includes installation device.

Just one easy motion across and the



Klearsight Windshield Cleaner

gives you a clean dry glass. Clings firmly to the shield. Ready for instant use from either side of shield.

Handsome and durable. Made of sturdy steel with rubber squeegee. Drawn spring insures uniform contact over all. Heavily japanned, $2.00.

ALCOLA

DEFIES COLD

The Best Alcohol Substitute under lowest temperatures; neither freezes nor evaporates. ALCOLA is chemically neutral. It will not rust or corrode. One treatment is enough for entire winter. ALCOLA raises the boiling point of your cooling system to 250 degrees—whereas alcohol boils at 131 degrees and water at 212 degrees—ALCOLA boils at 250 degrees. Price, in the U. S., $2.00 per box; price in Canada, $2.50 per box.

Open Territory for Live Representatives

Alcemo Mfg. Co., 120 Bridge St., Newark, N. J.

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CLEANERS, Glass Wind Shield (Continued)

Stadeker Metal Specialty Co., 358 W. Madison St., Chicago, Ill. "See Safe." (See page 271.)

Tri-Continental Corp., 702 Main St., Buffalo, N. Y.

Utility—See Hartenstein, R. P.

Wetco—See Wetherholt Co.

Wetherholt Co., 20 E. Jackson Blvd., Chicago, Ill. "Wetco."

White Lock Co., 202 S. State St., Chicago, Ill. "Auto Scope."

Windshield Cleaner Device Co., 1311 S. Figueroa St., Los Angeles, Cal. "Clearview."

Woodworth Mfg. Corp., Niagara Falls, N. Y. (See page 721.)

CLEANERS, LINOLEUM—See Compounds, Linoleum Cleaning

CLEANERS, Spark Plug

(For Spark Plug Brushes—See Brushes, Spark Plug)

Champion Spark Plug Co., 1016 Upton Ave., Toledo, O. "Minute." (See page 509.)

Minute—See Champion Spark Plug Co.

CLEANERS, Upholstery

(See Cleaners, Fabric; also Cleaners, Vacuum; also Nozzles, Air)

CLEANERS, Vacuum

Frantz Premier Co., Cleveland, O. "Handy."

Handy—See Frantz Premier Co.

Sterling Machine & Stamping Co., Wellington, O.

CLEANERS, WIND SHIELD—See Cleaners, Glass Wind Shield

CLEANING TOOLS—See Tools, Terminal Cleaning

CLEATS, Fibre Wiring

(See also Fibre, Hard)

American Vulcanized Fibre Co., Equitable Bldg., Wilmington, Del.

Blake Signal & Mfg. Co., 251 Causeway St., Boston, Mass. (See page 721.)

Continental Fibre Co., Newark, Del. (See page 199.)

Diamond State Fibre Co., Bridgeport, Pa.

National Fibre & Insulation Co., Yorklyn, Del. (See page 285.)

Spaulding & Sons Co., J., Wheeler St., Tonawanda, N. Y.

Standard Fibre Co., 11-15 Miller St., Somerville, Mass.

Wilmington Fibre Specialty Co., Wilmington, Del. (See page 285.)

CLEATS, WIRING—See Cleats Fibre Wiring

CLEVIS ANTI-RATTLERS FOR FORDS—See Anti-Rattlers, Brake Rod

CLEVISES, Aeroplane

Spranger Wire Wheel Co., Clayton Ave., Detroit, Mich.

CLEVISES, Automatic Tractor Release

(A Hitch that automatically uncouples the plow from the tractor when the plow strikes an obstruction)

Greer Automobile Co., Erwin, 1512 Wabash Ave., Chicago, Ill.

Johnson Bros. Co., Freeport, N. Y.

CLINCH RIVETS—See Rivets, Tubular and Clinch

CLINOMETERS, Aeroplane

Sperry Gyroscope Co., Brooklyn, N. Y.

CLIPPERS, Bolt and Rivet

(Hand Power)

Allen-Randall—See Porter, H. K.

Chambers Bros. Co., 52d & Media Sts., Philadelphia, Pa.

Easy—See Porter, H. K.

Elm City—See Schollhorn Co.

Helwig Mfg. Co., Seventh & Locust Sts., St. Paul, Minn.

Mann Corp., Kankakee, Ill.

Metal Stamping Co., 13th St. & Blvd., Long Island City, N. Y. "New Easy."

New Easy—See Metal Stamping Co.

New Easy—See Porter, H. K.

O. K.—See Porter, H. K.

Peck, Stow & Wilcox Co., Southington, Conn. "Pexto."

Pexto—See Peck, Stow & Wilcox Co.

Porter, H. K., Everett, Mass. "Easy," "New Easy," "Allen-Randall," "O. K." (See page 185.)

Roberts Mfg. Co., Park & Beacon Sts., Somerville, Mass. "Victor."

Schollhorn Co., Wm., New Haven, Conn. "Elm City."

Victor—See Roberts Mfg. Co.

CLIPPERS, RIVET—See Clippers, Bolt and Rivet

CLIPS, Curtain

(For attaching curtains to wind shields and bow sockets)

Metal Stamping Co., 13th St. & Boulevard, Long Island City, N. Y. "Perfection."

Perfection—See Metal Stamping Co.

Standard Top & Equipment Co., 1212 Huron Rd., Cleveland, O. "Swan."

Swan—See Standard Top & Equipment Co.

CLIPS, Electrical Test

(For testing electrical circuits at any point without removing insulation from wires or disconnecting)

Frankel Display Fixture Co., 177 Hudson St., New York, N. Y.

Mueller Electric Co., 423 High Ave., Cleveland, O.

CLIPS, HAT—See Hangers, Hat

CLIPS, Motorcycle Toe

Torrington Co., Torrington, Conn.

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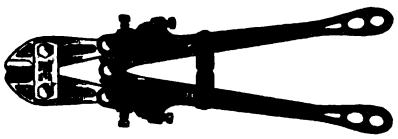
CUTTERS



10-Inch

Clipper Cut Jaws, for 3-16-in. annealed bolts in the thread, or 3-16-in. soft rivets.

Center Cut Jaws, for 3-16-in. soft rods.

14-Inch

Clipper Cut Jaws, for 1-4-in. annealed bolts in the thread, or 1-4-in. soft rivets.

Center Cut Jaws, for 1-4-in. soft rods.

Insulated Handles if desired.

H. K. PORTER

EVERETT, MASS.

"Easy," "New Easy" and Allen Randall Bolt Clippers

Gray Iron "QUALITY" CASTINGS Semi-Steel

Motor Castings, Intricate Cored Work and Work of a Kindred Nature Our Specialty

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CLIPS, Robe

(Metal clips to fasten or hold robe to robe rail)

Holdfast—See Parks Mfg. Co.

Parks Mfg. Co., 236 Aborn St., Providence, R. I. "Holdfast."

CLIPS, Spring

(See also Forgings, Drop)

Bonney Vise & Tool Works, Allentown, Pa. (See page 293.)

Clapp Mfg. Co., E. D., 305 W. Genesee St., Auburn, N. Y.

Cleveland Hardware Co., 4500 Hamilton Ave., Cleveland, O.

Columbus Bolt Works Co., Columbus, O. (See page 187.)

Eccles Co., Richard, 1-7 S. Division St., Auburn, N. Y.

Strieby & Foote Co., 301 Ogden St., Newark, N. J.

Union Forging Co., Union, N. Y. (See page 187.)

Wilcox Mfg. Co., D., Mechanicsburg, Pa.

CLIPS, TEST—See Clips, Electrical Test

CLIPS, TOE—See Clips, Motorcycle Toe

CLIPS, Trimmers

Buser-Poston Tufting Machine Co., Chillicothe, O.

Meyer & Co., John C., Lowell, Mass.

CLOCK DIALS—See Dials, Luminous

CLOCKS, Aircraft

Chelsea Clock Co., 10 State St., Boston, Mass.

Keyless Auto Clock Co., 246 W. 59th St., New York, N. Y.

Waltham Watch Co., Waltham, Mass.

CLOCKS, DASH BOARD—See Clocks, Electrically Wound; also Clocks, Hand Wound

CLOCKS, Electrically Wound

(For mounting on dash or instrument boards; for limousine clocks—See Watches, Limousine; also Cases, Toilet)

Boston Clock Co., 10 State St., Boston, Mass.

Cambria Clock Co., Bessemer Bldg., Pittsburgh, Pa.

Connecticut Clock Co., 284 Asylum St., Hartford, Conn.

E. A. Laboratories, Brooklyn, N. Y. (See page 359.)

Thompson Electric Clock Co., 3 S. Main St., Memphis, Tenn.

CLOCKS, Hand Wound

(For mounting on dash or instrument boards; See also Holders, Watch; for limousine clocks—See Watches, Limousine; also Cases, Toilet)

Aero—See New Haven Clock Co.

Arcadia—See Waterbury Clock Co.

Boston Clock Co., 10 State St., Boston, Mass.

Chelsea Clock Co., 10 State St., Boston, Mass.

Devere—See New Haven Clock Co.

Didisheim & Bro., Hipp, 54 Maiden Lane, New York, N. Y. "Octava."

Duane—See New Haven Clock Co.

Florida—See Waterbury Clock Co.

Keyless Auto Clock Co., 246 W. 59th St., New York, N. Y.

Nebo—See New Haven Clock Co.

New Haven Clock Co., 133 Hamilton St., New Haven, Conn. "New Ormond," "Duane," "Devere," "Aero," "Nebo."

New Ormond—See New Haven Clock Co.

Ocala—See Waterbury Clock Co.

Octava—See Didisheim & Bro.

Orlando—See Waterbury Clock Co.

Palatka—See Waterbury Clock Co.

Peck-Hamre Mfg. Co., Berlin, Wis.

Pensacola—See Waterbury Clock Co.

Sessions Clock Co., Forestville, Conn. (See page 187.)

Suwanee—See Waterbury Clock Co.

Tampa—See Waterbury Clock Co.

Tarpon—See Waterbury Clock Co.

Waltham Watch Co., Waltham, Mass.

Waterbury Clock Co., Waterbury, Conn. "Florida," "Pensacola," "Tampa," "Ocala," "Suwanee," "Tarpon," "Arcadia," "Orlando," "Palatka."

CLOCKS, Steering Wheel, for Fords

(See also Holders, Watch)

B-4-U—See Eisenstadt Mfg. Co.

Eisenstadt Mfg. Co., Olive & 12th Sts., St. Louis, Mo. "B-4-U."

CLOCKS, Time Recording and Watchman's

(For Time Stamps—See Stamps, Time)

Chicago Watchmans Clock Co., 56 E. Randolph St., Chicago, Ill.

International Time Recorder Co., Endicott, N. Y.

Simplex Time Recorder Co., Gardner, Mass.

CLOCKS, WATCHMAN'S—See Clocks, Time Recording

CLOSERS, DOOR, FOR FORDS—See Springs, Door Closing

CLOSETS, CLOTHES—See Lockers, Metal

CLOSING SPRINGS FOR FORDS—See Springs, Door Closing

CLOTH, EMERY AND SAND—See Paper, Emery and Sand

CLOTH, Enamel

Acme Rubber Mfg. Co., E. State St., Trenton, N. J.

American Rubberfelt Co., 2215 Elston Ave., Chicago, Ill. "Arco."

Arco—See American Rubberfelt Co.

Bayonne—See Boyle & Co.

Boyle & Co., John, 112-14 Duane St., New York, N. Y. "Bayonne."

Chandler Oil Cloth & Buckram Co., East Taunton, Mass.

Columbus-Union Oil Cloth Co., Grant & Seventh Sts., Columbus, O.

Heath & Son, Edmund F., Newark, N. J.

Landers Bros. Co., Blucher & Buckingham Sts., Toledo, O.

Meritas—See Standard Oil Cloth Co.

Monarch Rubber & Oil Cloth Co., Drexel Bldg., Philadelphia, Pa.

Potter Sons & Co., Thomas, Second & Erie Sts., Philadelphia, Pa.

Standard Oil Cloth Co., 320 Broadway, New York, N. Y. "Meritas."

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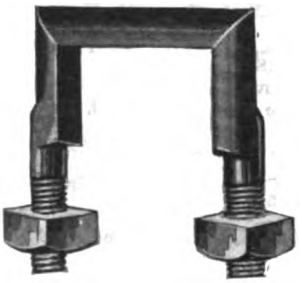
Automobile Spring Clips



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Special Automobile forgings made to blueprint or carried in stock.

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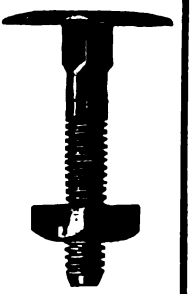
COLUMBUS, OHIO



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Piston and Piston Ring Pot Castings

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Largest Makers of Auto Spring Clips
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Union, N. Y.

Guaranteed Popular Price Auto Clocks that will pay you a good profit and give excellent satisfaction.

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Forestville, Conn.
37 Maiden Lane, New York, N. Y.

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CLOTH, Mohair

Barrell Co., Wm. L., New York, N. Y. "Zama." (See page 393,)
Bull Dog—See Mutty Co.
Carr Co., F. S., 31 Beach St., Boston, Mass. (See page 189.)
Chase & Co., L. C., Boston, Mass. "Wexford. (See page 497.)
Haartz, J. C., 10 High St., Boston, Mass.
Kantleak—See Scherer & Co.
Laidlaw Co., 16 W. 60th St., New York, N. Y. (See page 191.)
Landers Bros. Co., Blucher & Buckingham Sts., Toledo, O.
Mutty Co., L. J., Boston, Mass. "Bull Dog." (See page 391.)
Pickens Auto Cloth Co., 1777 Broadway, New York, N. Y. (Importers.)
Scherer & Co., H., 280 Jefferson Ave., E., Detroit, Mich. "Kantleak."
Wexford—See Chase & Co.
Zama—See Barrell Co.

CLOTH, Rubber Coated

Acme Rubber Mfg. Co., E. State St., Trenton, N. J.
American Rubber Co., 130 Essex St., Boston, Mass. "Drybak," "Naugahyde."
Bull Dog—See Mutty Co.
Carr Co., F. S., 31 Beach St., Boston, Mass. "Neverleek." (See page 189.)
Chase & Co., L. C., Boston, Mass. "Drednaut." (See page 497.)
Cooks Linoleum Co., E. State St., Trenton, N. J.
Drednaut—See Chase & Co.
Drybak—See American Rubber Co.
Du Pont Fabrikoid Co., Wilmington, Del. "Fairfield." (See page 169.)
Empire Rubber & Tire Co., Mulberry St. & Clinton Ave., Trenton, N. J.
Fairfield—See Du Pont Fabrikoid Co.
Haartz, J. C., 10 High St., Boston, Mass.
Halotex—See Laidlaw Co.
Heath & Son, Edmund F., Newark, N. J.
Hodgman Rubber Co., 806 Broadway, New York, N. Y.
Laidlaw Co., 16 W. 60th St., New York, N. Y. "Onyxcloth," "Halotex," "Storm King." (See page 191.)
Landers Bros. Co., Blucher & Buckingham Sts., Toledo, O.
Mattson Rubber Co., Lodi, N. J.
Monarch Rubber & Oil Cloth Co., Drexel Bldg., Philadelphia, Pa.
Mutty Co., L. J., Boston, Mass. "Bull Dog," "Numotor." (See page 391.)
Naugahyde—See American Rubber Co.
Neverleek—See Carr Co.
Numotor—See Mutty Co.
O'Bannon Corp., 200 Fifth Ave., New York, N. Y. (See pages 277 and 389.)
Onyxcloth—See Laidlaw Co.
Storm King—See Laidlaw Co.
United States Rubber Co., Malden, Mass.

CLOTH, UPHOLSTERY — See Cloth, Mohair; also Cloth, Enamel; also Cloth, Rubber; also Broadcloth; also Silk; also Whipcord

CLOTH, Wire

(For use in Strainers, Horn Screens, etc.)

Buffalo Wire Works Co., 431 Terrace, Buffalo, N. Y.
Clinton Wire Cloth Co., Clinton, Mass.
De Witt Wire Cloth Co., 291 Broadway, New York, N. Y.
Howard & Morse, 45 Fulton St., New York, N. Y. "National."
Michigan Wire Cloth Co., 511 Howard St., Detroit, Mich.
Multi-Metal Co., 258 W. 19th St., New York, N. Y. (See page 665.)
National—See Howard & Morse.
New Jersey Wire Cloth Co., 612 S. Broad St., Trenton, N. J.
Tyler Co., W. S., Superior Ave. & E. 36th St., Cleveland, O.
Wright Wire Co., Worcester, Mass. (See page 785.)

CLOTHES LOCKERS—See Lockers, Metal Clothes

CLOTHING, Aviators

(See also Helmets; also Gloves and Mittens)

Abercrombie & Fitch Co., Madison Ave. & 45th St., New York, N. Y.
International Coat Co., 114-16 Fifth Ave., New York. N. Y.
Nufleece—See Sanitary-Knit Fabric Co.
Sanitary-Knit Fabric Co., Columbus, O. "Nufleece."
Spalding & Bros., A. G., 126 Nassau St., New York, N. Y.

CLOTHING, Electrically Heated, Aviators

Simplex Electric Heating Co., 85 Sidney St., Cambridge, Mass.

CLOTHING, Motorists

(See also Caps; also Gloves; also Leggings; also Mufflers)

All-Over—See Ohio Overall Co.
Armi-Khaki—See Freneau-Sweeny Co.
Auto-Shirt Co., Midland, Md.
Automobile Apparel Co., Bush Ave., Port Chester, N. Y.
Ballard & Co., J. O., Malone, N. Y.
Beats All—See Standard Oiled Clothing Co.
Beaver Dam Overall Mfg. Co., Beaver Dam, Wis.
Bishop Co., J. H., Wyandotte, Mich.
Blauvelt Knitting Co., 280-84 Plane St., Newark, N. J.
Boynton's Improved Process Oil Clothing Co., Vincent St., Gloucester, Mass.
Bradley Knitting Co., Delavan, Wis.
Burlington Blanket Co., 711 Oregin St., Burlington, Wis.
Camden—See Goodrich Co.
Chippewa Falls Woolen Mill, Chippewa Falls, Wis.
Comfort Auto Robe Co., Waterloo, N. Y.
Cook & Bro., E. C., 1301-45 Carroll Ave., Chicago, Ill.
Coveralls—See Utility Garment Co.
Crosby-Frisian Fur Co., 571 Lyell Ave., Rochester, N. Y.
Demmerle & Co., 116 E. 23d St., New York, N. Y.
Dodge, H. C., 452 Fifth Ave., New York, N. Y.
Elco—See Loewenberg Co.
Ellsworth & Thayer Mfg. Co., 336-40 Broadway, Milwaukee, Wis. "Great Western."
Everdri—See Loewenberg Co.
Favorite Knitting Mills, 1388 W. Sixth St., Cleveland, O.

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Along the boulevard, in the stream of traffic, or parked along the curb, NEVERLEEK-topped cars are conspicuous for their smart appearance. That trim, taut stretch of NEVERLEEK top-material from windshield to rear window is a delight to the eye and distinguishes fine motor-cars from the common herd.

More than fifty manufacturers of foremost motor-vehicles use NEVERLEEK as standard top material. They chose it for its superior service in all weathers.

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If you are not yet acquainted with NEVERLEEK, write us today for free descriptive booklet, samples, and outline of our selling plan. Motorists say that "It's always fair weather 'neath NEVERLEEK." Give them what they want.

F. S. CARR COMPANY

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NEVERLEEK

TOP MATERIAL

This trade-mark (Reg. U. S. Pat. Off.) appears on every other yard of NEVERLEEK lining

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CLOTHING, Motorists (Continued)

Finck & Co., W. M., 1156 Gratiot St., Detroit, Mich.

Fox, Stiefel & Co., 349 Fifth Ave., New York, N. Y.

Franklin Rubber Co., 134 Federal St., Boston, Mass.

Freneau-Sweeny Co., 392 Fifth Ave., New York, N. Y. "Armi-Khaki."

Goodrich Co., B. F., S. Main St., Akron, O. "Camden."

Goodyear Rubber Co., 787 Broadway, New York, N. Y.

Great Western—See Ellsworth & Thayer Mfg. Co.

Guiterman Bros., St. Paul, Minn.

Hall & Co., R. S., Versailles, O.

Hill Mfg. Co., Richard F., 217-19 High St., Newark, N. J. "Kant Leak."

Hodgman Rubber Co., 806 Broadway, New York, N. Y.

Huchberger & Co., J., 93 Fifth Ave., New York, N. Y.

Improved Mfg. Co., Ashland, O.

International Coat Co., 114-16 Fifth Ave., New York, N. Y.

Jaegers S. W. S. Co., 395 Fourth Ave., New York, N. Y.

Kant Leak—See Hill Mfg. Co.

Kenreign—See Kenyon Co.

Kenyon Co., C., 754 Pacific St., Brooklyn, N. Y. "Kenreign."

Lamm Bros., 339-41 N. Gay St., Baltimore, Md

Lee Mercantile Co., H. D., 22d & Gillham Sts., Kansas City, Mo. "Unionalls."

Loewenberg Co., 58-62 Colden St., Newark, N. J. "Everdri," "Elco."

McKibben, Driscoll & Dorsey, Fifth St. & Broadway, St. Paul, Minn.

Manhattan—See Standard Oiled Clothing Co.

Mann Co., Léon, 906 Broadway, New York, N. Y.

Meier & Co., Louis, 1002-10 Central Ave., Indianapolis, Ind.

Moore-Smith Co., 250 Devonshire St., Boston, Mass.

Morawetz Co., 317-25 E. Water St., Milwaukee, Wis.

Norman Garment Co., 32 Union Sq., New York, N. Y.

Nufleece—See Sanitary-Knit Fabric Co.

Ohio Overall Co., Wooster, O. "All-Over."

Parker Co., John H., 25 James St., Malden, Mass.

Patrick & Co., F. A., Duluth, Minn.

Pontiac Knitting Co., Pontiac, Mich.

Protexall Co., Abingdon, Ill. (See page 603.)

Raybestos Co., Bridgeport, Conn. (See page 341.)

Reliable Coat Co., 113 Blum St., Union Hill, N. J.

Revillon Freres, 19 W. 34th St., New York, N. Y.

Rosenwald & Weil, 500 Franklin St., Chicago, Ill.

Ruszits Fur Co., John, 7 E. 48th St., New York, N. Y.

Sanders Co., 218½ Indiana Ave., Indianapolis, Ind.

Sanitary-Knit Fabric Co., Columbus, O. "Nufleece."

Scott & Co., 340 Washington St., Boston, Mass.

Shanhouse & Sons, W., Rockford, Ill.

Standard Oiled Clothing Co., 152d St. & Tinton Ave., New York, N. Y. "Beats All," "Manhattan."

Stroh's Detroit Overall Co., Detroit, Mich.

Toplitz, George, 11 E. 22d St., New York, N. Y.

Tower Co., A. J., 24 Simmons St., Boston, Mass.

Unionalls—See Lee Mercantile Co.

Utility Garment Co., 200 N. Jefferson St., Chicago, Ill. "Coveralls."

Wallace Co., Hugh, 2626 E. Grand Blvd., Detroit, Mich.

Wisconsin Garment Co., 711 Origen St., Burlington, Wis. "Wisgar Co."

Wisgar Co.—See Wisconsin Garment Co.

CLOTHS, POLISHING—See Wipers

CLOTHS, WIPING—See Wipers

CLUTCH CHECKS—See Checks, Clutch

CLUTCH COMPOUNDS—See Dressing, Clutch

CLUTCH CONTROLS FOR FORDS—See Controls, Clutch

CLUTCH COUPLINGS, MOTOR BOAT—See Couplings, Motor Boat Clutch

CLUTCH DISCS—See Discs, Steel Clutch; also Discs, Fabric Clutch

CLUTCH DRESSING—See Dressing, Clutch

CLUTCH HOUSINGS—See Housings, Special Clutch

CLUTCH INSERTS—See Cork, Brake and Clutch

CLUTCH LININGS—See Lining, Brake; also Leather, Friction

CLUTCH RELEASERS FOR FORDS—See Releasers, Clutch

CLUTCHES, Automobile Friction

Borg & Beck Co., Moline, Ill. (See page 193.)

C. A. S. Engineering Co., 790 Woodward Ave., Detroit, Mich. (Sole Distributors for Mechanics Machine Co., Rockford, Ill. (See page 313.)

Cotta Gear Co., 117-29 Morgan St., Rockford, Ill.

Detlaff, A. J., 121 E. Lafayette Ave., Detroit, Mich.

Fuller & Sons Mfg. Co., Kalamazoo, Mich. (See page 621.)

Goodspeed-Detroit Mfg. Co., 272-80 Harper Ave., Detroit, Mich.

Hartford Auto Parts Co., Hartford, Conn. (See page opposite inside Back Cover.)

Hele-Shaw—See Merchant & Evans Co.

Hilliard Clutch & Machinery Co., 104 W. Fourth St., Elmira, N. Y.

Hoosier Auto Parts Co., 718 S. Elliott St., Muncie, Ind.

Hoosier Motor Co., 612-14 E. Madison St., Goshen, Ind. "Never-Slip."

Mechanics Machine Co.—See C. A. S. Engineering Co.

Merchant & Evans Co., Philadelphia, Pa. "Hele-Shaw." (See page 377.)

Multiple Cone Clutch Co., Erie Bldg., Cleveland, O.

Never-Slip—See Hoosier Motor Co.

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The Laidlaw Company, Inc.

THE LAIDLAW BUILDING, 16 West 60th St., New York City

Specialists in Motor Car Fabrics

"LAIDLAW BURBANK" TOP COVERING "LAIDLAW BURBANK" SEAT COVER CLOTH	Closely woven, single texture, ALL-CLOTH, waterproof materials. Contain no rubber. (For Touring Cars.)
"LAIDLAW ONYXCLOTH"	Impregnated, waterproof, Seat Cover Material. (For Touring Cars.)
"LAIDLAW HALOTEX"	Waterproof, smooth surface, wear resisting, easily cleaned, upholstery fabric for Sedans and Convertible Bodies.
"LAIDLAW LIMOTEX"	Single texture, washable material for Touring Car Seat Covers, and Limousine Slip Covers.
"LAIDLAW STORM KING" TOP COVERING "LAIDLAW STORM KING" CURTAIN CLOTH.	Rubber coated materials. (For Touring Cars.) Also a complete line of MOHAIRS; MACKINTOSH CLOTHS; LEATHER FABRICS and RUBBER CLOTHS.

In addition to the above, we carry a wide selection of **HORSE HAIR CARPETS,** and **DEMOUNTABLE TOP LININGS,** with **NARROW LACES, CURTAIN SILKS** and **CARPETS** to match.

"LAIDLAW VOGUE"	Single texture, washable slip cover material, for Limousines.

LIMOUSINE LININGS, with CARPETS, SILKS, LACES and PASSEMENTERIE to match.

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CLUTCHES, Automobile Friction (Continued)

Positive Clutch Co., 1345 Rawson St., Chicago, Ill.

Verges Mfg. Co., 518 Prairie St., Milwaukee, Wis.

Warner Gear Co., Muncie, Ind. (See page 414.)

CLUTCHES, Motor Boat Friction

(See also Gears, Motor Boat Reverse)

Joe's—See Snow & Petrelli Mfg. Co.

Johnson Machine Co., Carlyle, 52 Main St., Manchester, Conn.

Snow & Petrelli Mfg. Co., 152 Brewery St., New Haven, Conn. "Joe's."

CLUTCHES, Tractor Friction

Bierman—See Strite Governor Pulley Co.

Hartford Auto Parts Co., Hartford, Conn. (See page opposite inside Back Cover.)

Hele-Shaw—See Merchant & Evans Co.

Hilliard Clutch & Machinery Co., Elmira, N. Y.

Hoosier Auto Parts Co., 718 S. Elliott St., Muncie, Ind.

Hoosier Motor Co., 612-14 E. Madison St., Goshen, Ind. "Never-Slip."

Johnson Machine Co., Carlisle, 52 Main St., Manchester, Conn.

Merchant & Evans Co., Philadelphia, Pa. "Hele-Shaw." (See page 377.)

Never-Slip—See Hoosier Motor Co.

Stoufer Mfg. Co., 1608 Stevens Ave., Minneapolis, Minn.

Strite Governor Pulley Co., Minneapolis, Minn. "Bierman."

Twin Disc Clutch Co., 1438 Bryan Pl., Chicago, Ill.

Universal Motor Co., 39 Ceape St., Oshkosh, Wis.

COACH LACE—See Lace, Coach

COACH SCREWS—See Screws, Coach

COASTER BRAKES, MOTORCYCLE—See Brakes, Motorcycle Coaster

COAT RAIL BAGS—See Bags, Coat Rail

COAT RAILS—See Rails, Robe or Coat

COATINGS, Aeroplane Wing

(See also Varnish; also Paints, Fireproofing)

Celstrom—See Chemical Products Co.

Chemical Products Co., 30 Charles River Rd., Cambridge, Mass. "Celstrom."

Dow Chemical Co., Midland, Mich.

Flexible Compound Co., 3607 Haverford Ave., Philadelphia, Pa.

Titanine, 2 Rector St., New York, N. Y.

Valentine & Co., 456 Fourth Ave., New York, N. Y. "Valspar."

Valspar—See Valentine & Co.

COCK CONTROL RODS FOR FORDS—See Rods, Gasoline Cock Control

COCK WRENCHES FOR FORDS—See Wrenches, Oil Cock

COCKS, DRAIN—See Cocks, Spring Key; also Cocks, Standard Pet

COCKS, FUEL SUPPLY AND RESERVE—See Valves, Two Way Tank

COCKS, Fuel Supply and Reserve, for Fords

(Two way cock to be attached to gasoline tank to ensure a reserve supply of fuel for emergency)

Central Brass & Fixture Co., Dept. A., Springfield, O. (See page 137.)

Stevens & Co., 375 Broadway, New York, N. Y.

COCKS, GASOLINE—See Cocks, Spring Key; also Cocks, Standard Pet

COCKS, PRIMING—See Cups, Priming

COCKS, RESERVE—See Valves, Two Way Tank

COCKS, RESERVE, FOR FORDS—See Cocks, Fuel Supply

COCKS, Spring Key

Amalgamated Brass Co., Blanchester, O.

American Brass & Iron Co., Detroit, Mich. (See page 153.)

Brass Products Co., 1067 Palmer Ave., E., Detroit, Mich.

Crum-Wiley Mfg. Co., Peru, Ind.

Detroit Valve and Fittings & Detroit Brass Works, 99 Hobart St., Detroit, Mich.

Edelmann & Co., E., 341-63 E. Ohio St., Chicago, Ill.

Exeter Brass Works, Exeter, N. H.

Hancock Mfg. Co., 770 Henry St., Charlotte, Mich.

Imperial Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill. (See page 733.)

Kant-Leak—See Michigan Lubricator Co.

Lincoln Brass Works, Detroit, Mich. (See page 193.)

Lunkenheimer Co., Beekman & Waverly Sts., Cincinnati, O.

National Brass Mfg. Co., 191-93 Mill St., Rochester, N. Y.

Michigan Lubricator Co., Detroit, Mich. "Kant-Leak." (See page 195.)

Powell Co., Wm., 2525 Spring Grove Cincinnati, O. (See page 195.)

Regar Brass Mfg. Co., 1523 E. 45th St., Cleveland, O. (See page 785.)

Roberts Brass Mfg. Co., 1395-1407 Fort St., W., Detroit, Mich.

Standard Brass Works, 97-109 Wight St., Detroit, Mich.

Williams Valve Co., D. T., Spring Grove Ave. & Township St., Cincinnati, O.

COCKS, Standard Pet

Acorn Brass Mfg. Co., 51 N. Peoria St., Chicago, Ill.

American Brass & Iron Co., Detroit, Mich. (See page 153.)

American Lubricator Co., 201 Summit Ave., Detroit, Mich.

Belfield Co., H., 435 N. Broad St., Philadelphia, Pa.

Belknap Mfg. Co., Bridgeport, Conn.

Brass Products Co., 1069 Palmer Ave., E., Detroit, Mich.

Buckeye Iron & Brass Works, 324 E. Third St., Dayton, O.

Commonwealth Brass Corp., Commonwealth Ave. & Grand Trunk Ry., Detroit, Mich.

Crane Co., 519 S. Canal St., Chicago, Ill.

Crum-Wiley Mfg. Co., Peru, Ind.

Detroit Lubricator Co., Trumbull & Grand Trunk R. R., Detroit, Mich.

Detroit Valve and Fittings & Detroit Brass Works, 99 Hobart St., Detroit, Mich.

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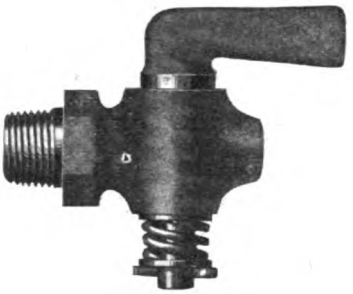

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WE SPECIALIZE IN

Gasoline Engine Cocks and Priming Cups; Radiator Drain Cocks; Carburetor Pet Cocks.

LINCOLN BRASS WORKS

Detroit - Michigan

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Malleable Iron Castings

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Malleable Iron Motor Car Parts

Manufactured by

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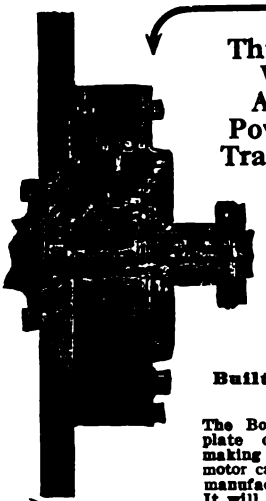
Windsor, Ontario



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The Borg & Beck single-plate dry-disc clutch is making good for leading motor car, truck and tractor manufacturers.
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MALLEABLE IRON CASTINGS

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COCKS, Standard Pet (Continued)

Eagle Brass Works, Dubois & Franklin Sts., Detroit, Mich.
Edelmann & Co., E., 341-49 E. Ohio St., Chicago, Ill.
Exeter Brass Works, Exeter, N. H.
Greer, Frederic, 525 W. Van Buren St., Chicago, Ill.
Haydenville Co., Haydenville, Mass.
Homer Brass Works, 231 Race St., Philadelphia, Pa.
Imperial Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill. (See page 733.)
Jarecki Mfg. Co., Erie, Pa.
Kant-Leak—See Michigan Lubricator Co.
Kelly & Jones Co., Greensburg, Pa.
Lincoln Brass Works, Detroit, Mich. (See page 193.)
Lunkenheimer Co., Beekman & Waverly Sts., Cincinnati, O.
McNab & Harlin Mfg. Co., 56 John St., New York, N. Y.
McRae & Roberts Co., 221-35 Campbell Ave., Detroit, Mich.
Michigan Lubricator Co., Detroit, Mich. "Kant-Leak." (See page 195.)
Morgan Mfg. Co., Keene, N. H.
National Brass Mfg. Co., 191-93 Mill St., Rochester, N. Y.
Nolte Brass Co., Springfield, O.
Powell Co., Wm., 2525 Spring Grove Ave., Cincinnati, O. (See page 195.)
Regar Brass Mfg. Co., 1523 E. 45th St., Cleveland, O. (See page 785.)
Regester's Sons Co., J., Holliday & Saratoga Sts., Baltimore, Md.
Roberts Brass Mfg. Co., 1395-1407 Fort St., W., Detroit, Mich.
Schaeffer & Budenberg Mfg. Co., Brooklyn, N. Y.
South Park Mfg. Co., Port Huron, Mich.
Standard Brass Works, 97-109 Wight St., Detroit, Mich.
Sterling & Skinner Mfg. Co., Russell St. & E. Grand Blvd., Detroit, Mich.
Western Brass Mfg. Works, Marshall Blvd., 21st St. & C. B. & Q. R. R., Chicago, Ill.
Williams Valve Co., D. T., Spring Grove Ave. & Township St., Cincinnati, O.

COCOA MATS—See Mats, Cocoa

COIL BOX PROTECTORS FOR FORDS—See Protectors, Coil Box

COIL BOXES—See Boxes, Spark Coil

COIL LOCKS FOR FORDS—See Locks, Switch and Coil

COIL PARTS—See Parts, Magneto, Coil and Distributor

COIL SPRINGS—See Springs, Machinery

COIL WINDINGS—See Windings, Starter and Ignition

COILS, Motor Boat Spark

Detroit Coil Co., 45 Fort St., E., Detroit, Mich.
Lemke Electric Co., 509-13 Cedar St., Milwaukee, Wis.
National Coil Co., N. Cedar St., Lansing, Mich.
New York Coil Co., 338-40 Pearl St., New York, N. Y.
Splitdorf Electrical Co., Newark, N. J.

COILS, Motorcycle Spark

Lemke Electric Co., 509-13 Cedar St., Milwaukee, Wis.
New York Coil Co., 338-40 Pearl St., New York, N. Y.
Splitdorf Electrical Co., Newark, N. J.

COILS, Spark

(See also Systems, Single Spark Ignition)

American Coil Co., Foxboro, Mass.
Ampco—See S-M Novelty Mfg. Co.
Autocoil Co., 132 Seventh St., Jersey City, N. J.
Berkshire—See Pittsfield Spark Coil Co.
Bosch Magneto Co., 223 W. 46th St., New York, N. Y.
Connecticut Telephone & Electric Co., Meriden, Conn. (See pages 676 and 677.)
Dow Mfg. Co., 131 Adams St., Braintree, Mass.
Fansteel Products Co., North Chicago, Ill. (See page 737.)
Heco—See Heinze Electric Co.
Heinze Electric Co., Lowell, Mass. "Heco."
J. & B. Mfg. Co., Pittsfield, Mass.
Jefferson Electric Co., 431 S. Green St., Chicago, Ill.
Jewell—See Pittsfield Spark Coil Co.
K-W Ignition Co., 2900 Chester Ave., Cleveland, O. (See page 449.)
Kingston—See Kokomo Electric Co.
Kokomo Electric Co., 1415 Webster St., Kokomo, Ind. "Kingston."
La Fer Instrument Co., 320 Frankfort Ave., Cleveland, O.
Micatite—See Pittsfield Spark Coil Co.
National Coil Co., N. Cedar St., Lansing, Mich.
New York Coil Co., 338-40 Pearl St., New York. N. Y.
Orswell Igniter Co., 37 Haverhill St., Boston, Mass. "Puritan."
Pittsfield Spark Coil Co., Pittsfield, Mass. "Jewell," "Berkshire," "Micatite."
Puritan—See Orswell Igniter Co.
Quick Action Ignition Co., South Bend, Ind.
S. M. Novelty Mfg. Co., 52d St. & Baltimore Ave., Philadelphia, Pa. "Ampco."
Splitdorf Electrical Co., Newark, N. J.
Wells Mfg. Co., R. C., Fond du Lac, Wis.
Williams, E. Q., 535-39 S. Clinton St., Syracuse, N. Y.

COILS, Spark, for Fords

(See also Vibrators, Master)

Heco—See Heinze Electric Co.
Heinze Electric Co., Lowell, Mass. "Heco."
Kingston—See Kokomo Electric Co.
Kokomo Electric Co., 1415 Webster St., Kokomo, Ind. "Kingston."

COLD CHISELS—See Chisels, Cold and Cape

COLD ROLLED STEEL—See Steel, Cold Rolled

COLD SAWS—See Saws, Cold

COLLAPSIBLE BUCKETS—See Buckets, Collapsible

COLLAPSIBLE PAILS—See Buckets, Collapsible

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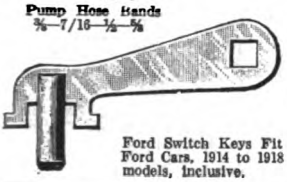
Pump Hose Bands
⅜—7/16—½—⅝



Ford Switch Keys Fit Ford Cars, 1914 to 1918 models, inclusive.

Ideal Clamp Mfg. Co., Inc.

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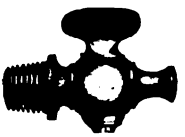
BROOKLYN, N. Y.

No. 1—150-Clamps.
No. 2—100-Clamps.



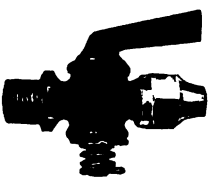
Michigan Motor Fittings

"The Guaranteed Kind"

We manufacture a full line of brass motor fittings including Kant-Leak gasoline cocks, sediment traps, primers, strainers, pipe and tube fittings, oil cups, oil gauges, grease cups, etc. ***Write for printed matter and prices.***

Michigan Lubricator Co., Detroit, Mich.

MA-19



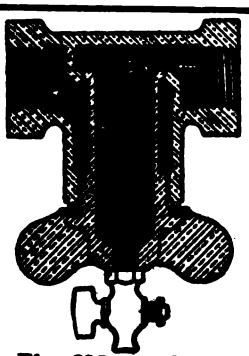


Fig. 696—strainer

POWELL AUTOMOBILE APPLIANCES

Are Guaranteed For Service and Durability

We manufacture a complete line of gasoline generator valves, cocks, strainers, cylinder lubricators, oil and grease cups, priming cups, unions and brass fittings. Dealers! Think this over and write for "Powell" Automobile Catalogue and Prices.

THE WM. POWELL COMPANY

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COLLAPSIBLE SPADES AND SHOVELS—See Spades and Shovels, Collapsible

COLORS, COACH—See Paints and Colors

COLUMN BRACES FOR FORDS—See Braces, Steering Column

COLUMNS, Water and Boiler Alarms

Reliance Gauge Column Co., 45 E. Prospect St., Cleveland, O.

COMMUTATORS, Electric Motor

Cameron Electrical Mfg. Co., 205 Main St., Ansonia, Conn.

Columbia Machine Works & Malleable Iron Co., Chestnut St. & Atlantic Ave., Brooklyn, N. Y.

Electric Materials Co., North East, Pa.

Eureka Co., North East, Pa.

Homer Commutator Co., 4748 Hough Ave., N. E., Cleveland, O.

COMMUTATORS, SPARK—See Timers, Ignition

COMPASSES, Aircraft

Creagh-Osborne—See Sperry Gyroscope Co.

International Aeronautical Instrument Corp., 308 Madison Ave., New York, N. Y.

Sperry Gyroscope Co., Brooklyn, N. Y. "Creagh-Osborne."

COMPASSES, Motorists Pocket

(For carrying when touring)

Ceebynite—See Taylor Instrument Cos.

Taylor Instrument Cos., 95 Ames St., Rochester, N. Y. "Ceebynite."

COMPENSATING GEARS—See Gears, Differential

COMPLETE CHASSIS—See Chassis, Complete

COMPOSITION CASTINGS—See Castings, Bronze and Brass

COMPOSITION CONTROL LEVER BALLS—See Balls, Composition Control Lever

COMPOSITION GASKETS—See Packing

COMPOSITION, Insulating

(Substitute for Hard Rubber)

Bakelite—See Boonton Rubber Mfg. Co.

Bakelite—See Evilo Molding Co.

Bakelite—See General Bakelite Co.

Bakelite—See Stevenson Co.

Bakelite-Dilecto—See Continental Fibre Co.

Bakelite Micarta—See Westinghouse Electric & Mfg. Co.

Boonton Rubber Mfg. Co., Boonton, N. J. "Bakelite."

Condensite—See Duranoid Mfg. Co.

Condensite Co. of America, Bloomfield, N. J.

Continental Fibre Co., Newark, Del. "Bakelite-Dilecto." (See page 199.)

Cutler Hammer Mfg. Co., 890 St. Paul Ave., Milwaukee, Wis. "Thermoplax," "Pyroplax."

Dayton Insulating Die Co., Fourth St., Dayton, O.

Duranoid Mfg. Co., 213-19 Chestnut St., Newark, N. J. "Condensite."

Electrose Mfg. Co., 70 Washington St., Brooklyn, N. Y.

Evilo Molding Co., Westfield, N. J. "Bakelite."

Garfield Mfg. Co., Garfield, N. J. "Gummon." "Tegit." "Hemit."

General Bakelite Co., 2 Rector St., New York, N. Y. "Bakelite." (See page 197.)

General Insulate Co., 1008-14 Atlantic Ave., Brooklyn, N. Y. "Hi-Heat."

Gummon—See Garfield Mfg. Co.

Hemit—See Garfield Mfg. Co.

Hi-Heet—See General Insulate Co.

International Insulating Corp., ft. Mechanic St., Springfield, Mass. "Sternoid," "Stern Condensite," "Stern Asbeston."

J. P. Bakelite—See Johns-Manville Co.

Johns-Manville Co., H. W., Madison Ave. & 41st St., New York, N. Y. (Sole Distributors for Johns-Pratt Co., Hartford, Conn. "Noark," "J. P. Bakelite," "Vulcabeston.")

Johns-Pratt Co.—See Johns-Manville Co.

Niagara Insul-Bake Specialty Co., Bath St. & Whirlpool Ave., Niagara Falls, N. Y.

Noark—See Johns-Manville Co.

Peuvallsmith Corp., Poughkeepsie, N. Y.

Pyroplax—See Cutler Hammer Mfg. Co.

Specialty Mfg. Co., Hoosick Falls, N. Y.

Stern Asbeston—See International Insulating Corp.

Stern Condensite—See International Insulating Corp.

Sternoid—See International Insulating Corp.

Stevenson Co., 511 Wallace Ave. (Wilkinsburg), Pittsburgh, Pa. "Bakelite."

Tegit—See Garfield Mfg. Co.

Thermoplax—See Cutler Hammer Mfg. Co.

Vulcabeston—See Johns-Manville Co.

Westinghouse Electric & Mfg. Co. (E. Liberty), Pittsburgh, Pa. "Bakelite Micarta."

COMPOUNDS, Anti-Freezing

(See also Alcohol, Denatured)

Ad-el-ite—See Adams & Elting Co.

Adams & Elting Co., 716-26 Washington Blvd., Chicago, Ill. "Ad-el-ite." (See page 199.)

Alcemo Mfg. Co., 120 Bridge St., Newark, N. J. "Alcola." (See page 183.)

Alcola—See Alcemo Mfg. Co.

Auto Remedy Co., Evans St., Cincinnati, O. "Magic."

Benoit, Constant A., Brooklyn, N. Y. "Non-Freez-Ene." (See page 169.)

Blue Ribbon Mfg. Co., 27 Baldwin St. (Charlestown), Boston, Mass. "Premium."

Bule Chemical Corp.—See Rodriguez, R. E.

Columbus Varnish Co., Columbus, O. "Peerless." (See page 253.)

Durkee-Atwood Co., Minneapolis, Minn. "Rie-Nie."

E. S. Q.—See Rodriguez, R. E.

Freeze-Proof—See Johnson & Son.

Frezalene Mfg. Co., 32-40 S. Clinton St., Chicago, Ill.

Imperial Oil Co., 1915 Locust St., St. Louis, Mo. "Marvin." (See page 197.)

Jewel—See Wadsworth-Howland Co.

Johnson & Son, S. C., 1012 16th St., Racine, Wis. "Freeze-Proof."

Magic—See Auto Remedy Co.

Martin-Senour Co., 2510 Quarry St., Chicago, Ill.

Marvin—See Imperial Oil Co.

No-Freeze—See Sterns & White Co.

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Sheets, Tubes and Rods

THESE convenient forms of Bakelite afford the manufacturer who does not wish to incur the expense of making special moulds an opportunity to take advantage of the superior insulating and physical properties and easy machining qualities of Bakelite at a very nominal cost.

Bakelite Sheet, Tube and Rod possesses even greater mechanical and dielectric strength than Bakelite Moulded Insulation. It is unaffected by water, steam, oils, solvents and most chemicals and will not bloom or swell.

These forms of Bakelite should be ordered from either Continental Fibre Co., Newark, Del., or Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.

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2 Rector Street New York

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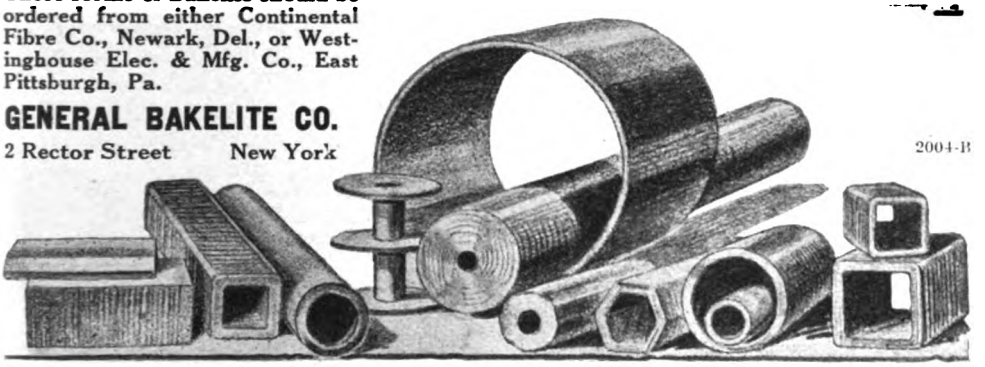

Absolute Protection Down to 20 Below Zero

MARVIN'S

ANTI-FREEZING COMPOUND

THE ORIGINAL AND GENUINE—READY MIXED—READY TO USE—NO TESTING REQUIRED

MARVIN'S is a neutral solution of harmless ingredients. Its reputation is backed by 13 winters of never-failing success. It CANNOT freeze—keeps the cooling system clean, will not injure the connections, gaskets or metal interior nor find leaks in the radiator. No measuring, dissolving or mixing required—MARVIN'S comes ready to use. No testing necessary—MARVIN'S is always freeze proof. Supplied in the following sizes—

3 Gal. Can	$2.80	½ Bbl.-30 Gal.	73c a Gal.
5 Gal. Can	$4.00	Bbls.-50 Gal.	70c. a Gal.

DEALERS—Write for our extra liberal proposition and trade discounts—mention jobber's name.

Manufactured Exclusively by

IMPERIAL OIL CO.

1915 Locust St., ST. LOUIS, U.S.A.

Also makers of EVR-LASTING GEAR COMPOUND

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COMPOUNDS, Anti-Freezing (Continued)

Non-Freez-Ene—See Benoit, Constant A.

Northwestern Chemical Co., 610 State St., Marietta, O. "Norwesco Twelve-Twenty." (See page 205.)

Norwesco Twelve-Twenty—See Northwestern Chemical Co.

Orex Mfg. Co. (West Middletown), Middletown, O.

Peerless—See Columbus Varnish Co.

Perma-Loc Mfg. Co., Scranton, Pa. (See page 495.)

Premium—See Blue Ribbon Mfg. Co.

Rie-Nie—See Durkee-Atwood Co.

Rodriguez, R. E., 56-58 Warren St., New York, N. Y. (Sole Distributor for Bule Chemical Corp., New York, N. Y.)

Stearns & White Co., 859 N. Franklin St., Chicago, Ill. "No-Freeze."

Wadsworth-Howland Co., 225 N. Carpenter St., Chicago, Ill. "Jewel."

COMPOUNDS, Brazing

A. & J. Mfg. Co., 559 W. Lake St., Chicago, Ill. "Brasiron."

Acme—See Universal Fluxine Co.

Aluminum Brazing Solder Co., Broad St. & Edgemont Ave., Chester, Pa. "Peters Nicro."

Banner—See Cortland Specialty Co.

Brasiron—See A. & J. Mfg. Co.

Cortland Specialty Co., 174-78 Railroad St., Cortland, N. Y. "Banner."

Cortland Welding Compound Co., Cortland, N. Y.

Dixon Crucible Co., Joseph, Jersey City, N. J. (See page 439.)

Durkee-Atwood Co., Minneapolis, Minn. "Rie-Nie."

Ever Right—See Fry, Keyser.

Ferro-Brazing Paste Co., 1423 Farragut Ave., Chicago, Ill.

Fluxine—See Krembs & Co.

Fry, Keyser, 616-22 N. Eighth St., Reading, Pa. "Ever Right."

Hall-Thompson Co., Hartford, Conn. "Wonder Worker." (See page 739.)

Kast-I-On—See Taber, Arthur L.

Krembs & Co., 173 N. Green St., Chicago, Ill. "Fluxine."

Miller Metalwork Co., Southington, Conn.

National Cement & Rubber Co., 300-16 S. St. Clair St., Toledo, O.

P. W. Mfg. Co., Philadelphia, Pa.

Peters Nicro—See Aluminum Brazing Solder Co.

Rie-Nie—See Durkee-Atwood Co.

Schneider, Emil, 298-306 South St., Newark, N. J.

Standard Brazing Co., 45 Bromfield St., Boston, Mass. "Tichon."

Standard Mfg. Co., 318 S. Canal St., Chicago, Ill. "Superior."

Superior—See Standard Mfg. Co.

Tabor, Arthur L., 218 E. Sixth St., Corona, Cal. "Kast-I-On."

Tichon—See Standard Brazing Co.

Universal Fluxine Co., Urbana, O. "Acme."

Westinghouse Electric & Mfg. Co., (E. Liberty), Pittsburgh, Pa.

Wonder Worker—See Hall-Thompson Co.

COMPOUNDS, Buffing and Polishing

Bennett-O'Connell Co., 3600 S. Morgan St., Chicago, Ill. "Mascot," "Excel-All."

Dixon, Wm., 39 John St., New York, N. Y.

Excel-All—See Bennett-O'Connell Co.

Lyman Co., John R., 119 Liberty St., Springfield, Mass.

Mascot—See Bennett-O'Connell Co.

Matchless Metal Polish Co., 149 Varick St., New York, N. Y. "White-Diamond."

Munning-Loeb Co., Church St., Matawan, N. J.

Stevens, Frederic B., Detroit, Mich. "White Rose," "White Columbia." (See page 776.)

White Columbia—See Stevens, Frederic B.

White-Diamond—See Matchless Metal Polish Co.

White Rose—See Stevens, Frederic B.

Williamsville Buff Mfg. Co., 24 School St., Danielson, Conn.

COMPOUNDS, Carbon Removing

(See also Removers, Carbon; also Machines, Motor Decarbonizing; also Moisteners, Air or Mixture)

Adams & Elting Co., 716-26 Washington Blvd., Chicago, Ill. "Ad-el-ite." (See page 199.)

Ad-el-ite—See Adams & Elting Co.

American Oil Products Co., 1426 Seneca St., Buffalo, N. Y. "Opco."

Benoit, Constant A., Brooklyn, N. Y. "Permatex." (See page 169.)

Blood & Co., T. L., St. Paul, Minn.

Blue Ribbon Mfg. Co., 27 Baldwin St., (Charlestown), Boston, Mass. "Premium."

Boyer Chemical Co., 18 E. Kinzie St., Chicago, Ill.

Bule Chemical Corp.—See Rodriguez, R. E.

Burnox Co., 6324 Greenfield Ave. (W. Allis), Milwaukee, Wis.

Car-Bon-Go—See Van Tilburg Oil Co.

Carbocide—See Van Cleef Bros.

Carbolide Chemical Co., Monrovia, Md.

Carbon Cleaning Compound Co., 901 N. Euclid Ave., St. Louis, Mo. "Four Sees."

Carbon-Not—See Rodriguez, R. E.

Carbonox—See Northwestern Chemical Co.

Chalmers Chemical Co., 115 Chestnut St., Newark, N. J. "Phenoid."

Columbus Varnish Co., Columbus, O. "Peerless." (See page 253.)

Cook, Geo. E., 2322 Broadway, New York, N. Y.

Corasco—See Manifold Heater Co.

Cowdin—See Delphi Auto Specialty Co.

Crystal Oil & Paint Co., 6500 Detroit Ave., Cleveland, O.

Delphi Auto Specialty Co., Delphi, Ind. "Cowdin."

Denegre Baked Enamel Remover Co., 1922-24 Ave. F, Birmingham, Ala.

Detroit White Lead Works, 530-60 Milwaukee Ave., E., Detroit, Mich.

Dulin Mfg. Co., J. E., 460 S. Grant St., Springfield, Mo. "Dumaco."

Dumaco—See Dulin Mfg. Co.

Durkee-Atwood Co., Minneapolis, Minn. "Rie-Nie."

Four Sees—See Carbon Cleaning Compound Co.

Francis-Rand Co., Erie Bldg., Cleveland, O. "Handy."

Franklin Distributing Co., 148 Elmwood Ave., Buffalo, N. Y.

French Compression Fluide Co., Pasadena, Cal.

Gramoline Co., 11 S. La Salle St., Chicago, Ill. "Lightning." (See page 201.)

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COMPOUNDS, Carbon Removing (Continued)

Hall-Thompson Co., Hartford, Conn. "Magic," "Wonder Worker." (See page 739.)

Handy—See Francis-Rand Co.

Harvey Chemical Co., 216 N. Fifth St., Lafayette, Ind.

Inter-Tube Chemical Co., 1223 Superior St., Cleveland, O.

Interstate Mfg. Co., Wollaston, Mass. "M. H. B."

Jewel—See Wadsworth-Howland Co.

Johnson & Son, S. C., 1012 16th St., Racine, Wis.

Karbon Killer—See Ohio Grease Co.

Karbon Klene Co., 227 S. Front St., Philadelphia, Pa.

Kimo Mfg. Co., 2625 Main St., Buffalo, N. Y.

Korine Carbon Remover Co., 136 Federal St., Boston, Mass.

Krembs & Co., 173 N. Green St., Chicago, Ill. "Purgcarbon."

Lightning—See Gramoline Co.

M. H. B.—See Interstate Mfg. Co.

Magic—See Hall-Thompson Co.

Manifold Heater Co., 15 Railroad St., Cortland, N. Y. "Corasco."

Mansfield Mfg. Corp., Syracuse, N. Y.

Martin-Senour Co., 2510 Quarry St., Chicago, Ill.

Milwaukee Auto Specialty Co., 705-15 Chestnut St., Milwaukee, Wis. "Radium."

Mitchell Co., W. M., 634 N. 29th St., Louisville, Ky. "Sure Shot."

Mitchell Mfg. Co., Balboa Bldg., San Francisco, Cal. "Yost."

Moto Motor Tonic Co., Wichita, Kans.

Northwestern Chemical Co., 610 State St., Marietta, O. "Carbonox." (See page 205.)

Nox-Carbon Remover Co., 1407 Florida Ave., Washington, D. C.

Ohio Grease Co., Box 21, Loudonville, O. "Karbon-Killer." (See page 199.)

Opco—See American Oil Products Co.

Orient Chemical Co., Gumbel Bldg., Kansas City, Mo.

Owl—See Western Chemical Mfg. Co.

Peerless—See Columbus Varnish Co.

Perma-Loc Mfg. Co., Scranton, Pa. (See page 495.)

Permatex—See Benoit, Constant, A.

Phenoid—See Chalmers Chemical Co.

Power-O—See Saries Mfg. Co.

Premium—See Blue Ribbon Mfg. Co.

Price, Roy D., Waggoner, Ill. "R-D-P."

Purgcarbon—See Krembs & Co.

R-D-P—See Price, Roy D.

Radium—See Milwaukee Auto Specialty Co.

Rie-Nie—See Durkee-Atwood Co.

Rodriguez, R. E., 56-58 Warren St., New York, N. Y. (Sole Distributors for Bule Chemical Corp., New York, N. Y.) "Carbon-Not."

Saries Mfg. Co., 624 N. Union St., Decatur, Ill. "Power-O."

Sure Shot—See Mitchell Co.

Universal Auto Specialty Co., 1080 Gilbert Ave., Cincinnati, O.

Van Cleef Bros., 7709-11 Woodlawn Ave., Chicago, Ill. "Carbocide."

Van Tilburg Oil Co., 2424-28 University Ave., S. E., Minneapolis, Minn. "Car-Bon-Go," "Wang."

Wadsworth-Howland Co., 225 N. Carpenter St., Chicago, Ill. "Jewel."

Wang—See Van Tilburg Oil Co.

Western Chemical Mfg. Co., 151 Sixth St., Milwaukee, Wis. "Owl."

Wonder Worker—See Hall-Thompson Co.

Woodworth Mfg. Corp., Niagara Falls, N. Y. (See page 721.)

Worko Co., 1712 Winslow St., Racine, Wis.

Yost—See Mitchell Mfg. Co.

COMPOUNDS, Case Hardening

Achilles—See Houghton & Co.

Acme—See European Color & Chemical Co.

Atlas—See European Color & Chemical Co.

Black Diamond—See Rogers & Hubbard Co.

Blaich Co., Alfred O., 1956 Clybourn Ave., Chicago, Ill. (See page 201.)

Bohnite—See Case Hardening Service Co.

Buchanan Chemical Co., C. G., 118 E. Pearl St., Cincinnati, O. "Ferro Case." (See page 201.)

Carbo—See Rodman Chemical Co.

Carbonit—See Springfield Facing Co.

Case Hardening Service Co., Cleveland, O. "Bohnite." (See page 201.)

Diamond—See European Color & Chemical Co.

European Color & Chemical Co., 154 Nassau St., New York, N. Y. "Excelsior," "Diamond," "Monitor," "Acme," "Atlas."

Excelsior—See European Color & Chemical Co.

Ferro Case—See Buchanan Chemical Co.

Hafleigh & Co., Cambria & American Sts., Philadelphia, Pa.

Houghton & Co., E. F., 240 W. Somerset St., Philadelphia, Pa. "Achilles," "Pearlite."

Ideal Case-Hardening Compound Co., 25 W. Broadway, New York, N. Y.

Kalux—See Metal Hardening Solution Co.

Keystone—See Rodman Chemical Co.

Metal Hardening Solution Co., 62-64 Raines Pk., Rochester, N. Y. "Kalux."

Monitor—See European Color & Chemical Co.

Montgomery Chemical Works, Title Bldg., Baltimore, Md.

Morris & Co., U. S. Yards, Chicago, Ill.

Mosso, C. A., 2253 B. Warren Ave., Chicago, Ill.

Pearlite—See Houghton & Co.

Pettinos Bros., 25 Church St., New York, N. Y.

Portland—See Rogers & Hubbard Co.

Rodman Chemical Co., East Pittsburgh, Pa. "Carbo," "Keystone."

Rogers & Hubbard Co., Middletown, Conn. "Black Diamond," "Standard," "Portland."

Springfield Facing Co., 317 Main St., Springfield, Mass. "Carbonit."

Standard—See Rogers & Hubbard Co.

Stevens, Frederic B., Detroit, Mich. (See page 776.)

COMPOUNDS, Chemical Plating

(See also Polishes, Metal; also Enamels, Brass)

Arnold, N. B., 1 Sigourney St., Brooklyn, N. Y. "Silkup."

Atlas Auto Supply Co., 697 W. Austin Ave., Chicago, Ill. "Silver Quick." (See page 207.)

Blue Ribbon Mfg. Co., 27 Baldwin St. (Charlestown), Boston, Mass. "Premium."

Durkee-Atwood Co., Minneapolis, Minn. "Rie-Nie."

Eastern Rubber Co., 1529 Ridge Ave., Philadelphia, Pa. "Magic."

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W. W. Wells, 368 Victoria St., Toronto.
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Henry Heil Chemical Co., 210 So. 4th St., St. Louis.
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COMPOUNDS, Chemical Plating (Continued)

Forest City Sales Co., Fremont, Neb. "Quick Knick."

Justice Co., A. R., 617 Chestnut St., Philadelphia, Pa. "U-Kan-Plate."

Magic—See Eastern Rubber Co.

Naspel—See National Silver Plating Laboratories.

National Silver Plating Laboratories, 410 Lafayette St., New York, N. Y. "Naspel."

Premium—See Blue Ribbon Mfg. Co.

Quick Knick—See Forest City Sales Co.

Rie-Nie—See Durkee-Atwood Co.

Silver Quick—See Atlas Auto Supply Co.

Silkup—See Arnold, N. B.

U-Kan-Plate—See Justice Co.

Van Tilburg Oil Co., 2424-28 University Ave., S. E., Minneapolis, Minn. "Wang."

Wang—See Van Tilburg Oil Co.

COMPOUNDS, Core

Cataract Refining & Mfg. Co., Marine Natl. Bank Bldg., Buffalo, N. Y.

Corul—See Swan & Finch Co.

Ebony—See Hill & Griffith Co.

Glutrin—See Robeson Process Co.

Hill & Griffith Co., C. H. & D. Ry. & Gest St., Cincinnati, O. "Ebony," "Linoline."

King Kore Kompound—See Stevens, Frederic B.

Linoline—See Hill & Griffith Co.

McCormick Co., J. S., 2428-36 Railroad St., Pittsburgh, Pa.

Mills Mfg. Co., H. E., 263 Walton St., Syracuse, N. Y.

Obermayer Co., S., 647 Evans St., Cincinnati, O.

Robeson Process Co., 18 E. 41st St., New York, N. Y. "Glutrin."

Stevens, Frederic B., Detroit, Mich. "King Kore Kompound." (See page 776.)

Swan & Finch Co., 165 Broadway, New York, N. Y. "Corul."

Van Tilburg Oil Co., 2424-28 University Ave., S. E., Minneapolis, Minn. "Vanco."

Vanco—See Van Tilburg Oil Co.

COMPOUNDS, Gasoline Treating

Alvord Sales Co., 80 Terrace, Buffalo, N. Y.

Auto Accessories Co., Woolworth Bldg., Lancaster, Pa. "Auto-Pep."

Auto-Pep—See Auto Accessories Co.

Auto Remedy Co., Evans St., Cincinnati, O. "Magic."

Auto Vim—See H. G. Chemical Products Co.

Car-Bon-Ale Co., Bertrand, Neb.

Carbonvoid—See Lloyd's of America.

Culco—See Culmer Chemical Co.

Culmer Chemical Co., Independence, Kans. "Culco."

De-Carbo-Cide—See Grace & Co.

Desmond Mfg. Co., 346 Atlantic Ave., Brooklyn, N. Y. "Miracle." (See page 489.)

Eccolene Co., Detroit, Mich. (See page 203.)

Econ-O-Kleen Fuel Co., 105 Labree Ave., Thief River Falls, Minn.

Elgin Motor Power Mfg. Co., 416 Third Ave., Cedar Rapids, Ia.

Eureka Auto Products Co., 123 Liberty St., New York, N. Y. "Hy-sign."

Fueline Co., 188 Market St., Newark, N. J.

Gas-Zip—See Sealer Distributing Co.

Gaso-Tonic Co., Cincinnati, O.

Gastine Co., Bridgeton, N. J.

Go Gas, 42d St. & Lexington Ave., New York, N. Y.

Grace & Co., 3205 W. Washington St., Los Angeles, Cal. "De-Carbo-Cide."

H. G. Chemical Products Co., Swetland Bldg., Cleveland, O. "Auto Vim."

Hy-sign—See Eureka Auto Products Co.

Inajiffi Mfg. Co., Walsh Bldg., Akron, O.

Karbonoid Chemical Co., 318 East Ave., Elyria, O.

Karbono Sales Co., Utica, N. Y.

King, L. Gerald, 21 Pine St., Deposit, N. Y.

King Karbon Killer Corp., 15 Park Row, New York, N. Y.

Lloyd's of America, Bradley Beach, N. J. "Carbonvoid."

Magic—See Auto Remedy Co.

Mercier, Paul, 907 John St., Utica, N. Y.

Miracle—See Desmond Mfg. Co.

Motorlife Mfg. Co., 955-57 Poplar Ave., Memphis, Tenn.

Moto Whiz—See Ray Mfg. Co.

N. Y. & Brooklyn Auto Supply Co., 1717 Broadway, New York, N. Y.

National Karbonoid Corp., 131 Columbus Ave., Boston, Mass.

Pepolene—See Universal Auto Specialty Co.

Permatite Mfg. Co., 67 Fifth Ave., N. E., Minneapolis, Minn.

Ray Mfg. Co., 1627 Columbia Ave., Philadelphia, Pa. "Moto Whiz."

Sales Service Co., 13 Water St., New York, N. Y.

Sealer Distributing Co., Railway Exchange Bldg., Chicago, Ill. "Gas-Zip."

Standard Chemical Co., Black Bldg., Los Angeles, Cal.

Tankii Chemical Sales Co., 224 High St., Cleveland, O.

Universal Auto Specialty Co., 1080 Gilbert Ave., Cincinnati, O. "Pepolene."

COMPOUNDS, Glass Windshield

(For keeping glass clear in rain or fog; for Mechanical Cleaners—See Cleaners, Glass Windshield)

Alder Chemical Co., Mt. Vernon, N. Y. "Star."

Badger Mfg. Corp., Milwaukee, Wis. "Rain-a-Way." (See page 139.)

Blue Ribbon Mfg. Co., 27 Baldwin St. (Charlestown), Boston, Mass. "Premium."

C-Cleer—See Sole Mfg. Co.

Chemical Spray Co., 74 Pearl St., Boston, Mass.

Clear-Site—See Wa-Po Products Co.

Cleveland Presto-Cloth Co., 1401 E. 93d St., Cleveland, O.

Cristalene—See Mahlmann, Altona & Co.,

Davis Chemical Mfg. Co., 306 Warren Ave., Brockton, Mass.

Durkee-Atwood Co., Minneapolis, Minn. "Rie-Nie."

Emerald—See Thurston Specialty Co.

Forbes Co., Benjamin P., 409 Superior Ave., N. W., Cleveland, O. "Glasbrite."

General Mfg. Co., 240 Fifth St., San Francisco, Cal. "Klear-Glas."

Glasbrite—See Forbes Co.

Hall-Thompson Co., Hartford, Conn. "Wonder Worker." (See page 739.)

Klear-Glas—See General Mfg. Co.

Mahlmann, Altona & Co., 601-05 E. Court Ave., Des Moines, Ia. "Cristalene."

Mosher, J. H., 23 Walnut St., Seneca Falls, N. Y. "Sturm Wrag."

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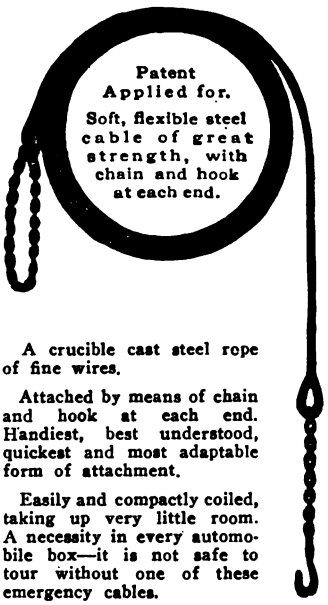

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COMPOUNDS, Glass Windshield (Continued)

Premium—See Blue Ribbon Mfg. Co.
Presto-Cloth Mfg. Co., Toledo, O.
Rain-a-Way—See Badger Mfg. Corp.
Rain-Sno—See Suffolk Mfg. Co.
Rie-Nie—See Durkee-Atwood Co.
Safety Storage Co., 700 Central Ave., Minneapolis, Minn.
Sole Mfg. Co., 148 Chambers St., New York, N. Y. "C-Cleer."
Star—See Alder Chemical Co.
Sturm Wrag—See Mosher, J. H.
Suffolk Mfg. Co., 69 Long Wharf, Boston, Mass. "Rain-Sno."
Three-In-One Oil Co., 165 Broadway, New York, N. Y.
Thurston Specialty Co., 129 Church St., New Haven, Conn. "Emerald."
Van Tilburg Oil Co., 2424-28 University Ave., S. E., Minneapolis, Minn. "Wang."
Wa-Po Products Co., 111 W. South Water St., Chicago, Ill. "Clear-Site."
Wang—See Van Tilburg Oil Co.
Wonder Worker—See Hall-Thompson Co.

COMPOUNDS, GRINDING — See Compounds, Valve Grinding

COMPOUNDS, HARDENING—See Compounds, Case Hardening

COMPOUNDS, Linoleum Cleaning

Ferdinand & Co., L. W., 152 Kneeland St., Boston, Mass. (See page 379.)

COMPOUNDS, LUMINOUS—See Paints, Luminous

COMPOUNDS, PHOSPHORESCENT — See Paints, Luminous

COMPOUNDS, PLATING — See Compounds, Chemical Plating

COMPOUNDS, POLISHING — See Compounds, Buffing and Polishing

COMPOUNDS, Puncture Sealing

(For use in pneumatic tires for automatically sealing small leaks resulting from punctures)

Airtite Co., 22 Motor Mart, Boston, Mass.
Alcemo Mfg. Co., 120 Bridge St., Newark, N. J. "Kor-Ker." (See page 183.)
Auto Necessities Co., Austin, Minn.
Blau, Jacob B., 622 N. Connecticut Ave., Atlantic City, N. J.
Crew-Levick Co., 111 N. Broad St., Philadelphia, Pa. "Tire Seal."
Dannenhirsch Co., 1905 W. Dauphin St., Philadelphia, Pa. "Tyre Lyfe."
Gee-Bee—See Green Bay Supply Co.
Green Bay Supply Co., 518 Maine St., Green Bay, Wis. "Gee-Bee." (See page 207.)
Hollingshead Co., R. M., 112 N. Ninth St., Camden, N. J. "Whiz."
Innerseal—See Syndicate Sales Co.
Jovo—See Vogel Co.
Kor-Ker—See Alcemo Mfg. Co.
L-Ty-To—See Schofield Laboratories Co.
Marvel Tire Life Co., Kansas City, Mo.
Nu-Way Puncture Cure Co., 224 Pine St., Green Bay, Wis.
Ray Mfg. Co., 1627 Columbia Ave., Philadelphia, Pa.
Relax Co., Norwood, O.
Schofield Laboratories Co., Kansas City, Mo. "L-Ty-To."
Sealo—See Steinberg, N. L.
Steinberg, N. L., 14 E. Jackson Blvd., Chicago, Ill. "Sealo."
Syndicate Sales Co., Syndicate Trust Bldg., St. Louis, Mo. "Innerseal."
Tire Seal—See Crew-Levick Co.
Tyre Lyfe—See Dannenhirsch Co.
Vogel Co., Joseph A., 1203 Lombard St., Wilmington, Del. "Jovo."
Whiz—See Hollingshead Co.

COMPOUNDS, Radiator Cleaning

(For Radiator Cement—See Cement, Radiator)

American Oil Products Co., 1426 Seneca St., Buffalo, N. Y. "Opco."
Banner—See Cortland Specialty Co.
Corol Co., Westminster Bldg., Chicago, Ill.
Cortland Specialty Co., 174-78 Railroad St., Cortland, N. Y. "Banner."
Decalcifier—See Milwaukee Auto Specialty Co.
Durkee-Atwood Co., Minneapolis, Minn. "Rie-Nie."
Elder Mfg. Co., 2305 N. Illinois St., Indianapolis, Ind. "Radio."
Elgin Motor Power Mfg. Co., 416 Third Ave., Cedar Rapids, Ia.
Field Auto Compound Mfg. Co., Auburn, Mo.
Fluff-Foe—See Garratt-Callahan Co.
Frezalene Mfg. Co., 32-40 S. Clinton St., Chicago, Ill.
Garratt-Callahan Co., 37 S. Clinton St., Chicago, Ill. "Fluff-Foe."
Gee-Bee—See Green Bay Supply Co.
Green Bay Supply Co., 518 Maine St., Green Bay, Wis. "Gee-Bee." (See page 207.)
Hall-Thompson Co., Hartford, Conn. "Wonder Worker." (See page 739.)
Hollingshead Co., R. M., 112 N. Ninth St., Camden, N. J. "Whiz."
Milwaukee Auto Specialty Co., 705-15 Chestnut St., Milwaukee, Wis. "Decalcifier."
Nip Rust—See Reflex Ignition Co.
Northwestern Chemical Co., 610 State St., Marietta, O. "Skalex." (See page 205.)
Opco—See American Oil Products Co.
Perma-Loc Mfg. Co., Scranton, Pa. (See page 495.)
Radio—See Elder Mfg. Co.
Reflex Ignition Co., 1710 Payne Ave., Cleveland, O. "Nip Rust." (See page 595.)
Rie-Nie—See Durkee-Atwood Co.
Skalex—See Northwestern Chemical Co.
Sutherland & Co., P., 232 Milk St., Boston, Mass. "Velvet."
Van Cleef Bros., 7709-11 Woodlawn Ave., Chicago, Ill.
Velvet—See Sutherland & Co.
Whiz—See Hollingshead Co.
Wonder Worker—See Hall-Thompson Co.
Young & McBride, Catasauqua, Pa.

COMPOUNDS, RADIATOR SEALING — See Cement, Radiator Repair

COMPOUNDS, Rust Preventing and Removing

American Chemical Paint Co., 1118-26 S. 11th St., Philadelphia, Pa. "Deoxidine."

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"The original self-acting radiator cement. When poured into the radiator 'it finds the leak and fixes it'—permanently and quickly." Price, 7 ounce can (Powder), or 10 ounce can (Liquid), 75c. Packed 12 in Carton, list price, $9.00 Dealers' net price, $5.40 per Carton.

"TWELVE-TWENTY"

The perfected Non-Freeze for Radiators. You can test its strength — with an ordinary hydrometer. No more costly guesswork. Comes ready to use. No mixing or dissolving — just pour it in. Protects to 20° below zero. Price, 1-gallon can, $1.25; 3-gallon can, $3.45; 5-gallon can, $5.00. Dealers' discount 33⅓ per cent.

SKALEX

Removes all lime, rust and sediment. Prevents over-heating — cannot injure the radiator. Price per 14 ounce can, 75c. Packed 12 in carton, list price $9.00. Dealers' net price $5.40 per carton.

NORWESCO

The Chemically Correct Line

If you're not handling NORWESCO products, stock them now and get ready for big sales.

NORWESCO products have been big sellers right from the start—and this year, sales are sure to eclipse all records. For this year, we are conducting the greatest advertising campaign that has ever appeared in the Saturday Evening Post on chemical automobile specialties. The keynote is: NORWESCO products are "chemically correct" and cannot fail. It's the big sales argument. Use it in selling NORWESCO products.

Ask Your Jobber

Valve Grinding Compound

Always gets the same excellent results as its consistency is always the same. Free from ground glass and emery. Price per 4 ounce D. E. can 40c. Packed 12 in carton, list price $4.80. Dealers' net price $2.88 per carton. Price per 1 lb. cans $1.00. Packed 12 to the carton list price $12.00. Dealers' net price $7.20 per carton.

Mohair Top Dressing and Lining Dye

A dressing which penetrates the fabric and makes it waterproof. For Mohair tops and all top linings. Pints 75c. Packed 12 in carton, list price, $9.00. Dealers' net price $5.85 per carton. Quarts $1.25, packed 12 in carton, list price $15.00. Dealers' net price $9.75 per carton.

Utility Black

An air-drying enamel for use on all metal parts of an automobile. Price, pints, $1.00. Packed 12 in carton, list price $12.00. Dealers' net price, $6.50 per carton. ½ pints 60c. Packed 12 in carton, list price $7.20. Dealers' net price, $4.68 per carton.

Other NORWESCO Products

CARBONOX	Carbon Remover
NEVER-BURN	Engine Enamel
TIRE-LAC	Tire Paint
FIRE-FLY	Dry-Fire Extinguisher.
NORWESCO	Rim and Gasket Shellac
NORWESCO	Neatsfoot Clutch & Brake Comp.
NORWESCO	Automobile & Furniture Polish
NORWESCO	Prussian Blue
NORWESCO	Rim Graphite Coating
NORWESCO	Aluminum Bronze
NORWESCO	Color Varnishes
NORWESCO	Soldering Paste
NORWESCO	Pumice Hand Soap
NORWESCO	Tire-Talc
NORWESCO	Tire-Mica

Leather, Pantasote Top and Upholstery Dressing

For leather and pantasote tops; also for upholstery. Waterproofs and preserves the material. Price, pints 75c. Packed 12 in carton, list price $9.00. Dealers' net price $5.85 per carton. Quarts $1.25, packed 12 in carton, price $15.00. Dealers' net price $9.75 per carton.

The Northwestern Chemical Company

610 State St., MARIETTA, O., U.S.A.

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COMPOUNDS, Rust Preventing and Removing (Continued)

American Rust Proof Co., 220 Fifth Ave., New York, N. Y. "Vatudrip."

Cedaroleum Co., Perkinsville, Vt.

Deoxidine—See American Chemical Paint Co.

Gramoline Co., 11 S. La Salle St., Chicago, Ill. "Rusticene." (See page 201.)

Oakley Chemical Co., 22 Thames St., New York, N. Y. "Oakite."

Oakite—See Oakland Chemical Co.

Parker Rust Proof Co. of America, 15-33 Conant Ave., Detroit, Mich.

Polygon Products Co., 141 Milk St., Boston, Mass. "Tasgon."

Rust Proof Mfg. Co., 1779 Atlantic Ave., Brooklyn, N. Y.

Rusticene—See Gramoline Co.

Tasgon—See Polygon Products Co.

Vatudrip—See American Rust Proof Co.

COMPOUNDS, Tar Removing

(For removing Tar or Road Oils from bodies)

Bule Chemical Corp.—See Rodriguez, R. E.

Cooper & Osterhout, 342 Vanduzer St., Watertown, N. Y. "Tarof."

Du Pont Chemical Co., Wilmington, Del.

Franklin Distributing Co., 148 Elmwood Ave., Buffalo, N. Y.

Johnson & Son, S. C., 1012 16th St., Racine, Wis.

Movisco Products Co., 18 South St., Utica, N. Y.

Rodriguez, R. E., 56-58 Warren St., New York, N. Y. (Sole Distributors for Bule Chemical Corp., New York, N. Y.)

Sanozone Chemical Co., 5 N. 20th St., Philadelphia, Pa.

Tarof—See Cooper & Osterhout.

Vulcanite Products Co., 1630 Vine St., Philadelphia, Pa.

COMPOUNDS, Tire Filling

(Rubber or composition filling for Pneumatic Tires to be used in place of air)

Aero Cushion Tire Co., 525-27 W. Santa Clara St., San Jose, Cal.

Bettern-Air—See Hulshizer, Allen G.

Boska Mfg. Co., Highland, N. Y.

Carter-Bell Mfg. Co., Morris Ave., Millburn, N. J.

Clarks Resilient Tire Filler Co., Thomasville, Ga.

Dahl Punctureless Filler & Rim Co., 15th St. & Hennepin Ave., Minneapolis, Minn.

Essenkay Products Co., 220-22 W. Superior St., Chicago, Ill.

Hulshizer, Allen G., 1306-08 Callowhill St., Philadelphia, Pa. "Bettern-Air."

National Rubber Filler Co., 204 Main St., Midlothian, Texas.

National Synthetic Rubber & Tire Co., 1482 Broadway, New York, N. Y. "Resilonite."

National Tire Cushion Co., 1511 McGee St., Kansas City, Mo.

Newmastic Co., 151 W. 68th St., New York, N. Y.

Panama Rubber & Equipment Co., 1423 Locust St., St. Louis, Mo.

Resilonite—See National Synthetic Rubber & Tire Co.

Skalex—See Northwestern Chemical Co.

COMPOUNDS, Tire Preserving

(Chemical compound or paint for applying to tires to preserve the rubber—See also Paints, Rubber.)

Dees & Wheatley, 47 Main St., Midlothian, Tex.

Save-O Co., Asylum & Ann Sts., Hartford, Conn.

COMPOUNDS, Tire Repair

(For filling cuts in outer casings or shoes)

American Automobile Accessories Co., B. & O. R. R. & Blue Rock St., Cincinnati, O. "Kutite."

American Rubber & Tire Co., 100 Beech St., Akron, O. "Stickfast."

Atlas Auto Supply Co., 697 W. Austin Ave., Chicago, Ill. "Tire-Doh." (See page 207.)

Bestyet—See St. Louis Rubber Cement Co.

C. O. T. Gum Gum—See Tingley & Co.

Cox, David H., 812 Chestnut St., Roselle, N. J.

Cut Weld—See Keystone Rubber Mfg. Co.

Durkee-Atwood Co., Minneapolis, Minn. "Rie-Nie."

Eastern Rubber Co., 1529 Ridge Ave., Philadelphia, Pa. "Magic Rubber Mend."

Eclipse Cement & Blacking Co., 1238 Belmont Ave., Philadelphia, Pa.

Elgin Motor Power Mfg. Co., 416 Third Ave., Cedar Rapids, Ia.

Empire Rubber & Tire Co., Mulberry St. & Clinton Ave., Trenton, N. J.

Eureka Cement Co., 2-6 Ave. A, Newark, N. J.

Firestone Tire & Rubber Co., Miller & Sweitzer Ave., Akron, O.

Fixit—See Gorman Co.

Goodrich Co., B. F., S. Main St., Akron, O.

Gorman Co., J. P., 380-84 Canal St., New York, N. Y. "Fixit." (See page 367.)

Hall-Thompson Co., Hartford, Conn. "Wonder Worker." (See page 739.)

Hazen-Brown Co., 430 Court St., Brockton, Mass. "Nu-Tread."

Hold-Tite—See Portage Rubber Co.

Jiffy—See Johnstown Rubber Co.

Johnstown Rubber Co., Johnstown, Pa. "Jiffy."

Keystone Rubber Mfg. Co., Erie, Pa. "Cut Weld."

Knead-It—See M. & M. Mfg. Co.

Kushion-Kore—See American Kushion-Kore Tire Co.

Kutite—See American Automobile Accessories Co.

Lee Tire & Rubber Co., 245 W. 55th St., New York, N. Y.

M. & M. Mfg. Co., Lime & Western Aves., Akron, O. "Knead-It."

Magic Rubber Mend—See Eastern Rubber Co.

Mastic—See Michelin Tire Co.

Mattson Rubber Co., Lodi, N. J.

Meng Co., A. P., 3605 Fifth Ave., Pittsburgh, Pa. "Mengo."

Mengo—See Meng Co.

Michelin Tire Co., Milltown, N. J. "Mastic."

Miller Rubber Co., Dept. A 43, Akron, O. (See page 705.)

Narco—See National Rubber Co.

National Cement & Rubber Co., 300-16 S. St. Clair St., Toledo, O.

National Rubber Co., 4409 Papin St., St. Louis, Mo. "Narco."

Nu-Tread—See Hazen-Brown Co.

Perma-Tite—See Motor Supplies Mfg. Co.

Permatite Mfg. Co., 67 Fifth Ave., N. E., Minneapolis, Minn.

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FREE DISPLAYS

Attract More Business!

This big, beautiful sign in your window draws dollars your way. It's 27 x 42 inches and handsomely lithographed in colors. Also ask for one of our attractive new Tire-Doh counter-stands to help boost your profits.

Big Sales—Big Gains

Tire-Doh has over a million users. Every autoist and householder needs this handy rubber repair. It adds thousands of miles to the life of tires. For blow-outs and inner tube tears it has no equal. This year national magazines, sporting journals and farm papers are telling millions more about Tire-Doh.

Good Profit for Dealers

Write now for special proposition and samples of free advertising helps.

ATLAS AUTO SUPPLY CO.
697 W. Austin Ave., Chicago, Ill.

Four Automobile Necessities

BIG MONEY FOR DEALERS

"GEE-BEE"—Cleans a car without "soap or water"—simply moisten a piece of cloth and go over surface of car. Removes dirt—dust—grease—smoky appearance and road oil like magic.

"GEE-BEE" PUNCTURE HEALER makes it unnecessary to remove tires from wheels to fix punctures.

"GEE-BEE" LEAK-STOP—will repair a leaky radiator in two minutes—and make it as strong as ever.

"GEE-BEE" NON-RUST—is a preparation every car owner should have—it keeps the radiator from rusting—thus prolonging its life and makes the cooling system more efficient.

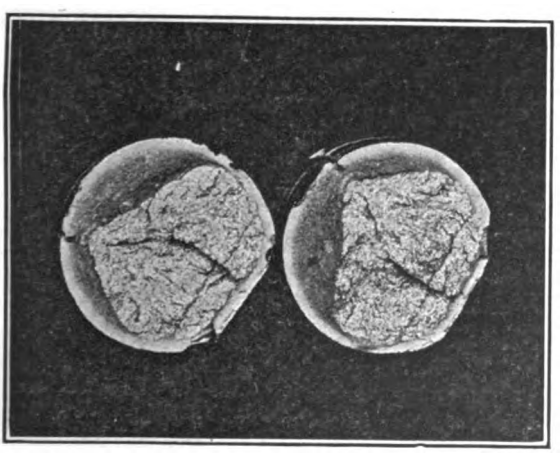
Dealers who are looking for a line of fast selling auto necessities will find these "four" the best they ever handled—write for terms to the trade.

Manufactured by

Green Bay Supply Co.
518 Maine Street
Green Bay, Wisconsin

OUR SPECIALTIES:—

Case Hardening, Hardening, Annealing, Tempering, "Carbonia," or Gun Metal Finish



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Adding Machine Parts
Gears
Machine Tool Spindles
Screw Machine Products
Stampings
Wrist Pins and Sleeves
Chain
And Parts for Automobiles, Tractors, Aeroplanes, Motorcycles and Motorboats

AMERICAN METAL TREATMENT CO.

ELIZABETH, N. J.

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COMPOUNDS, Tire Repair (Continued)

Portage Rubber Co., Barberton, O. "Holdtite."
Quaker City Rubber Co., 629 Market St., Philadelphia, Pa. "Quakerdo."
Quakerdo—See Quaker City Rubber Co.
Rie-Nie—See Durkee-Atwood Co.
S-V—See Williams Mfg. Co.
St. Louis Rubber Cement Co., 3046 Lambdin Ave., St. Louis, Mo. "Bestyet."
Stickfast—See American Rubber & Tire Co.
Tingley & Co., Chas. O., 21 St. Georges Ave., Rahway, N. J., "G. O. T. Gum Gum," "Tire Solder."
Tire-Doh—See Atlas Auto Supply Co.
Tire Solder—See Tingley & Co.
Tire-Tite—See Vul-Tex Mfg. Co.
Treado Mfg. Co., 42 Dwight St., Springfield, Mass.
Two in One—See Van Cleef Bros.
Van Cleef Bros., 7709-11 Woodlawn Ave., Chicago, Ill. "Two in One."
Vul-Tex Mfg. Co., 140 E. Lake St., Minneapolis, Minn. "Tire-Tite."
Williams Mfg. Co., 18th & Carman Sts., Camden, N. J. "S-V."
Wonder Worker—See Hall-Thompson Co.

COMPOUNDS, Valve Grinding

(Specially prepared abrasive compounds for grinding engine valves)

Auto Equipment Co., 32 Hollywood Ave., East Orange, N. J. "Eureka."
Bridgeport Wood Finishing Co., New Milford, Conn. "Lithowite."
Carborundum Co., Niagara Falls, N. Y. (See page 209.)
Clover Mfg. Co., Dey St., Norwalk, Conn.
Cook, Geo. E., 2322 Broadway, New York, N. Y.
Diamond—See Hall-Thompson Co.
Durkee-Atwood Co., Minneapolis, Minn. "Rie-Nie."
E-Fec-Tiv—See Permatite Mfg. Co.
E. Z.—See International Mfg. & Sales Co.
Eureka—See Auto Equipment Co.
Faw, J. H., 37 Warren St., New York, N. Y. (Eastern and Southern Distributors for Eureka Compounds.) (See page 387.)
Gryndyn—See Stewart & Co.
Hall-Thompson Co., Hartford, Conn. "Wonder Worker," "Quick Kut," "Diamond." (See page 739.)
Hollingshead Co., R. M., 112 N. Ninth St., Camden, N. J. "Whiz."
Ideal Valve Grinder Co., 1478 W. 22d St., Los Angeles, Cal. "O. K."
International Mfg. & Sales Co., 6304 Wallace St., Chicago, Ill. "E. Z.," "Peerless," "X. L."
Lightning Mfg. Co., Cornish Flat, N. H.
Lithowhite—See Bridgeport Wood Finishing Co.
Mohawk Grinding Paste Mfg. Co., Albany, N. Y.
National Valgrinok Co., 195 Church St., Newton, Mass. "Valgrinok."
Northwestern Chemical Co., 610 State St., Marietta, O. "Norwesco." (See page 205.)
Norton Co., Worcester, Mass.
Norwesco—See Northwestern Chemical Co.
O. K.—See Ideal Valve Grinder Co.
Peerless—See International Mfg. & Sales Co
Perma-Loe Mfg. Co., Scranton, Pa. (See page 495.)
Permatite Mfg. Co., 67 Fifth Ave., N. E., Minneapolis, Minn. "E-Fec-Tiv."
Purfex Mfg. Co., 126 N. Fourth St., Philadelphia, Pa.
Quick-Kut—See Hall-Thompson Co.
Rapidcut—See S. B. R. Specialty Co.
Rie-Nie—See Durkee-Atwood Co.
S. B. R. Specialty Co., 17-19 Princeton St., East Orange, N. J. "Rapidcut."
Smith Machine Works, Winton L., Newark, N. J.
Standard—See Stewart & Co.
Stewart & Co., 351 W. 26th St., New York, N. Y. "Gryndyn," "Standard."
Valgrinok—See National Valgrinok Co.
Van Cleef Bros., 7709-11 Woodlawn Ave., Chicago, Ill.
Van Tilburg Oil Co., 2424-28 University Ave., S. E., Minneapolis, Minn. "Wang."
Volcano Mfg. Co., 1049 W. 55th St., Los Angeles, Cal.
Wang—See Van Tilburg Oil Co.
Whiz—See Hollingshead Co.
Wonder Worker—See Hall-Thompson Co
X. L.—See International Mfg. & Sales Co.

COMPOUNDS, VULCANIZING—See Compounds, Tire Repair

COMPOUNDS, Welding

Banner—See Cortland Specialty Co.
Cortland Specialty Co., 174-78 Railroad St., Cortland, N. Y. "Banner," "Excelsior."
Cortland Welding Compound Co., Cortland, N. Y. "Weld-A-Cast."
Dingee, Mont. H., Lynchburg, Va. "Sparger's."
Excelsior—See Cortland Specialty Co.
Krembs & Co., 173 N. Green St., Chicago, Ill "Weldine."
Sparger's—See Dingee, Mont. H.
Universal Fluxine Co., Urbana, O.
Vulcan Process Co., 2450 University Ave., S. E., Minneapolis, Minn.
Weld-A-Cast—See Cortland Welding Compound Co.
Weldine—See Krembs & Co.

COMPOUNDS, WHEEL TIGHTENING—See Compounds, Wood Wheel Tightening

COMPOUNDS, WIND SHIELD—See Compounds, Glass Wind Shield

COMPOUNDS, Wood Wheel Tightening

(For swelling and tightening loose spokes in wood wheels)

Spoktite—See Woodtite Laboratories.
Woodtite Laboratories, Modesto, Cal. "Spoktite."

COMPRESSED AIR ENGINE STARTERS—See Starters, Compressed Air Engine

COMPRESSING TOOLS—See Tools, Valve Spring Lifting and Compressing

COMPRESSION COUPLINGS—See Unions, Tubing

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Gordon Cam Shafts

AS a result of conscientious effort to produce a cam shaft of highest quality which will give in service all that the most careful attention to detail assures, we specialize in building for those people whose product has to pass **Government** Inspection, and we guarantee unsurpassed service in every detail exacted by same.

L·O·GORDON MANUFACTURING CO.

MOTOR CAM SHAFTS

MUSKEGON, MICH.

Carborundum Valve Grinding Compound

Aloxite Cloth

A clean-cutting cloth that cuts faster, lasts longer, does better work than the ordinary "emery" cloth. Coated with Aloxite—harder, sharper, tougher than emery.

Get Aloxite Cloth in fifty-yard Economy Rolls—six widths—any grit.

A quick, clean-cutting compound that lightens the work of valve grinding—leaves a true, unscored valve seat—saves time—saves effort. It's a mixture of Carborundum—the hardest, sharpest, fastest cutting of all materials—with a high-grade grease.

Carborundum Compound Cuts

Put up in one- and five-pound tins and handy combination cans. *Write for circular and prices of Carborundum products for garage.*

Carborundum Grinders

Handy, serviceable machines for grinding any of the edge tools of the garage.—Every machine fitted with genuine Carborundum wheels. The No. 4 Niagara Grinder or the No. 28, double wheel, grinder stand are recommended for general garage work.

The Carborundum Company

Niagara Falls, N. Y.

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COMPRESSION GAGES—See Gages, Cylinder Compression

COMPRESSION METERS—See Gages, Cylinder Compression

COMPRESSION RELIEF COCKS — See Cocks; also Cups, Spring Key

COMPRESSION TESTERS—See Gages, Cylinder Compression

COMPRESSORS, AIR—See Pumps

CONDENSERS, Electric

Magneto Winding Co., 1723-25 Eighth Ave., Brooklyn, N. Y. (See page 493.)

CONDENSERS, Radiator

(To be attached to radiator cap to prevent the loss of water or anti-freezing mixture and obviate the necessity of constant refilling of radiator)

Automobile Devices Co., Real Estate Trust Bldg., Philadelphia, Pa. "Burke."

Burke—See Automobile Devices Co.

CONDUIT, Flexible Car Wiring

(Metal and fabric conduit; see also Tubing, Flexible Metallic)

Alphaduct Co., 186 Cator Ave., Jersey City, N. J.

American Metal Molding Co., 141 N. J. Railroad Ave., Newark, N. J.

Auto-Brassflex—See National Metal Molding Co.

Auto-Steelflex—See National Metal Molding Co.

Duraduct—See Tubular Woven Fabric Co.

National Metal Molding Co., Fulton Bldg., Pittsburgh, Pa. "Auto-Steelflex," "Auto-Brassflex."

Safety-Armorite Conduit Co., Bailey-Farrell Bldg., Pittsburgh, Pa.

Titeflex Metal Hose Corp., Badger Ave. & Runyon St., Newark, N. J. (See page 727.)

Tubular Woven Fabric Co., Pawtucket, R. I. "Duraduct."

CONES, BALL—See Cups, Ball

CONNECTING ROD BABBITTING JIGS FOR FORDS—See Jigs, Connecting Rod Babbitting

CONNECTING ROD BUSHINGS — See Bushings, Bronze

CONNECTING ROD GAGES FOR FORDS —See Gages, Connecting Rod

CONNECTING ROD REAMERS FOR FORDS—See Reamers, Main Bearing and Connecting Rod

CONNECTING RODS—See Rods, Connecting

CONNECTIONS, Air System Tire

Hansen Mfg. Co., Cleveland, O. (See page 711.)

Romort Mfg. Co.—See Zinke Co.

Zinke Co., 1323-25 Michigan Ave., Chicago, Ill. (Sole Distributors for Romort Mfg. Co., Oakfield, Wis.) (See pages 548 and 549.)

CONNECTIONS, BATTERY—See Connectors, Battery

CONNECTIONS, Brass Water

American Brass & Iron Co., Detroit, Mich. (See page 153.)

Greer, Frederic, 525 W. Van Buren St., Chicago, Ill.

Imperial Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill. (See page 733.)

Standard Metalwork Co., 92-108 Prospect St., Thompsonville, Conn.

Standard Tool & Mfg. Co., 68-72 E. Lafayette Ave., Detroit, Mich.

Whitlock Coil Pipe Co., Hartford, Conn.

Western Brass Mfg. Works, Marshall Blvd., 21st. St. & C., B. & Q. R. R., Chicago, Ill.

Wilkinson Co., Wm. H., West Medway, Mass

CONNECTIONS, Gas Tubing

(Brass Y's, T's and L's for connecting Acetylene Headlights.)

Cox Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y.

Morgan Mfg. Co., Keene, N. H.

Uniform Seamless Wire Co., 71 Peck St., Providence, R. I.

Western Brass Mfg. Works, Marshall Blvd., 21st St. & C., B. & Q. R. R., Chicago, Ill.

CONNECTIONS, PUMP—See Connections, Tire Pump

CONNECTIONS, RADIATOR, FOR FORDS —See Hose, Radiator

CONNECTIONS, SPARK—See Joints, Ball

CONNECTIONS, Steering

Amco—See Automotive Mfg. Co.

Automotive Mfg. Co., Dime Bank Bldg., Detroit, Mich. "Amco."

Billings & Spencer Co., Laurel & Park Sts., Hartford, Conn.

Cincinnati Ball Crank Co. (Oakley), Cincinnati, O. (See page 353.)

Michigan Electric Welding Plant, 514 Hart Ave., Detroit, Mich. (See page 400.)

S & W—See Schweppe & Wilt Mfg. Co.

Schweppe & Wilt Mfg. Co., Detroit, Mich. "S & W." (See page 211.)

CONNECTIONS, STEERING, FOR FORDS —See Links, Steering

CONNECTIONS, THROTTLE—See Joints, Ball

CONNECTIONS, Tire Pump

Acorn—See Stevens & Co.

Acornett—See Stevens & Co.

Adjustable Lighter Co., 18 Pearl St., Newton, Mass. "Larkin."

Anthony—See Gorman Co.

Austin & Co., H. K., 23 Lincoln St., Reading, Mass.

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QUALITY

Castings in *all* of the non-ferrous metals are

OBTAINABLE AT OUR FOUNDRY

Specify **"HECLA"** ANTI-FRICTION **BRONZE** for Bearings

THOMAS PAULSON & SON, Inc.

97 Second Avenue :: Brooklyn, N. Y.

S. & W. Patented Safety Reach Rods

OUR SLOGAN:

"Remember human life depends upon the quality of workmanship."

WE SPECIALIZE IN TRUCK AND PASSENGER CAR

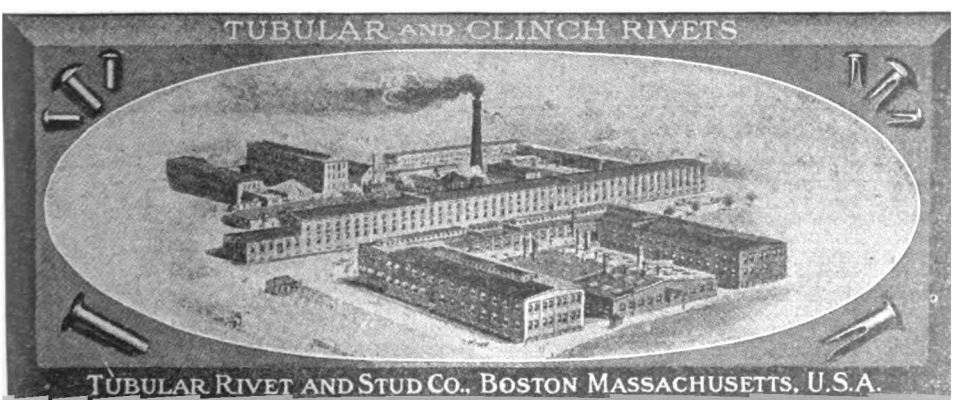
Reach Rods	Tie Rods
Radius Rods	Torque Assemblies
Special Steering Assemblies	Screw Machine Parts

Over 70% of the large producers of automobiles equip with

S. & W. SAFETY STANDARD PRODUCTS

The Schweppe & Wilt Mfg. Co.

Detroit, Mich.



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CONNECTIONS, Tire Pump (Cont'd)

Bell Pump & Mfg. Co., 74-78 Fort St. E., Detroit, Mich.

Chicago Recording Scale Co., Madison & Sand Sts., Waukegan, Ill. "Cresco."

Codman & Shurtleff, 120 Boylston St., Boston. Mass.

Cresco—See Chicago Recording Scale Co.

De Luxe—See Edelmann & Co.

Edelmann & Co., E., 341-63 E. Ohio St., Chicago, Ill. "Old Reliable, "De Luxe."

Evertight—See Smith Bros. Garage.

Gleason-Peters Air Pump Co., 384 Classon Ave., Brooklyn, N. Y.

Globe Mfg. Co., 64 Grant St., Battle Creek, Mich.

Gorman Co., J. P., 380-84 Canal St., New York, N. Y. "Anthony." (See page 367.)

Grab—See Motor Car Equipment Co.

Greer, Frederic, 525 W. Van Buren St., Chicago, Ill.

Gurnard Mfg. Co., Rantoul St., Beverly, Mass. "Thum-Lock."

Hansen Mfg. Co., Cleveland, O. (See page 711.)

Ideal—See Stevens & Co.

Judd & Leland Mfg. Co., Clifton Springs, N. Y. (See page 535.)

Keno—See Stevens & Co.

King, L., Gerald, 21 Pine St., Deposit, N. Y.

Larkin—See Adjustable Lighter Co.

Mayo-Skinner Mfg. Co., 2115 Elston Ave., Chicago, Ill. (See page 539.)

Motor Car Equipment Co., 21 W. 62d St., New York, N. Y. "Grab."

Nelson Mfg. Co., A., 2700 Southport Ave., Chicago, Ill.

Noera Mfg. Co., 21-97 Griggs St., Waterbury, Conn.

Old Reliable—See Edelmann & Co.

Osborne & Stephenson Mfg. Co., Plainville, Conn.

Perfect—See Youse Co.

Perfection—See Smith Auto Co.

Perfection—See Stevens & Co.

Romort Mfg. Co.—See Zinke Co.

Schrader's Son, A., 783-91 Atlantic Ave., Brooklyn, N. Y. (See page 331.)

Smith Auto Co., Clyde H., Skowhegan, Me "Perfection."

Smith Bros. Garage, 467-69 Main St., Melrose, Mass. "Evertight."

Stevens & Co., 375 Broadway, New York, N. Y. "Keno," "Perfection," "Acorn," "Ideal," "Acornett."

Sunderland Mfg. Co., 602 W. 22d St., Chicago, Ill. (See page 401.)

Thumblock—See Webber & Doyle.

Thum-Lock—See Gurnard Mfg. Co.

Webber & Doyle, Nicolet Ave., Detroit, Mich. "Thumblock."

Youse Co., E. S., 46 N. Fifth St., Reading, Pa. "Perfect."

Zinke Co., 1323-25 Michigan Ave., Chicago, Ill. (Sole Distributors for Romort Mfg. Co., Oakfield, Wis.) (See pages 548 and 549.)

CONNECTIONS, TRACTOR—See Clevises, Automatic Tractor

CONNECTIONS, TRAILER—See Couplers, Trailer

CONNECTIONS, TUBING—See Unions, Tubing

CONNECTORS, Acetylene Lamp

(Flexible Metal Connectors; for Rubber Connectors—See Tubing, Soft Rubber)

Breeze Mfg. Co., 250-52 South St., Newark, N. J.

Mattson Rubber Co., Lodi, N. J.

Pennflex—See Pennsylvania Flexible Metallic Tubing Co.

Pennsylvania Flexible Metallic Tubing Co., Broad & Race Sts., Philadelphia, Pa.

Titeflex Metal Hose Corp., Badger Ave. & Runyon St., Newark, N. J. (See page 727.)

CONNECTORS, Battery

(See also Terminals, Wire)

American Ever Ready Works, Thomson Ave & Orton St., Long Island City, N. Y. "Bull Dog."

Bailey Co., W. J., Newark, N. J. "C. B."

Becco—See Michigan Motor Specialties Co

Belden Mfg. Co., 2309 S. Western Ave., Chicago, Ill.

Bliss-Chester Co., Providence, R. I.

Breaznell, J. H., 26 Court St., Brooklyn, N. Y.

Bull Dog—See American Ever Ready Works.

C. B.—See Bailey Co.

Chicago Electric Mfg. Co., 2817 S. Halsted St., Chicago, Ill. "Handy."

Evergood—See Grossman Mfg. Corp.

Fahnestock Electric Co., Hunters Point, Long Island City, N. Y.

Fitzgerald Mfg. Co., Railroad Ave., Torrington, Conn. "Perfection," "Standard." (See page 309.)

Goodson—See Graham Mfg. Co.

Graham Mfg. Co., 94 Point St., Providence, R. I. "Goodson."

Grossman Mfg. Corp., Emil, Bush Terminal Bldg. No. 20, Brooklyn, N. Y. "Holdfast," "Evergood."

Handy—See Chicago Electric Mfg. Co.

Harvard Electric Co., 525 W. Van Buren St., Chicago, Ill.

Hi-Po Waterproof Battery Corp., South Norwalk, Conn.

Holdfast—See Grossman Mfg. Corp.

Lombardi Motor Car Co., 67-71 Minerva St., Derby, Conn.

Michigan Motor Specialties Co., 26-40 Dubois St., Detroit, Mich. "Becco."

Perfection—See Fitzgerald Mfg. Co.

Picard & Co., A. J., 9 W. 61st St., New York, N. Y. (Metropolitan Distributors for "Handy" Connectors.) (See page 273.)

Quick Action Ignition Co., South Bend, Ind.

Shain, Chas. D., Brooklyn, N. Y.

Sherman Mfg. Co., H. B., 12 Barney St., Battle Creek, Mich.

Standard—See Fitzgerald Mfg. Co.

CONNECTORS, BELT—See Fasteners, Belt

CONNECTORS, Electric Lamp

Aid Mfg. Co., 2625-31 Stewart Ave., Chicago, Ill. "Amco."

Amco—See Aid Mfg. Co.

Anchor—See Metal Specialties Mfg. Co.

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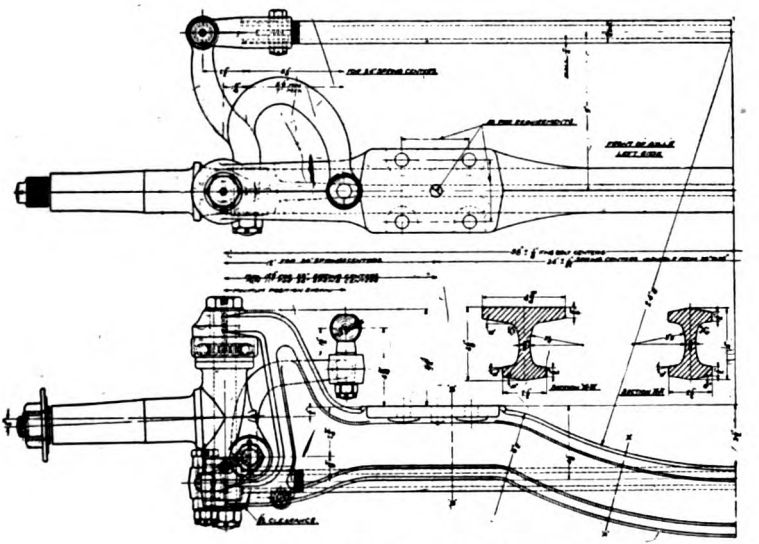

THREE TON CAPACITY

Heavy Duty Truck Axles

FOR UNUSUAL SERVICE

High Grade Drop Forgings

Pressed Steel Frames

General Machine Work

SAVAGE ARMS CORPORATION

FORMERLY

DRIGGS-SEABURY ORDNANCE CO.

SHARON, PENN.

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CONNECTORS, Electric Lamp (Continued)

Brock Rubber Co.—See Zinke Co.

Chicago Electric Mfg. Co., 2817 S. Halsted St., Chicago, Ill. "Handy."

Cole & Co., Henry, 54 Old Colony Ave., Boston, Mass.

Culver-Stearns Mfg. Co., Detroit, Mich. (See page 381.)

Douglas & Rudd Mfg. Co., Bronson, Mich.

Faw, J. H., 37 Warren St., New York, N. Y. (Eastern and Southern Distributors for Culver-Stearns Connectors.) (See page 387.)

Handy—See Chicago Electric Mfg. Co.

Higginson-Gibson Mfg. Co., 74 Atlantic St., Boston, Mass.

Howe Mfg. Co., Chicago, Ill.

Metal Specialties Mfg. Co., 338-52 N. Kedzie Ave., Chicago, Ill. "Anchor." (See page 333.)

Morse, Frank W., 289 Congress St., Boston, Mass. (See page 453.)

Picard & Co., A. J., 9 W. 61st St., New York, N. Y. (Metropolitan Distributors for "Handy" Connectors.) (See page 273.)

Rosco—See Rosen & Co.

Rosen & Co., A. W., 610-14 Broadway, New York, N. Y. "Rosco."

Smith Mfg. Co., F. A., 185-87 N. Water St., Rochester, N. Y.

Vesta Accumulator Co., 2100 Indiana Ave., Chicago, Ill.

Zinke Co., 1323-25 Michigan Ave., Chicago, Ill. (Sole Distributors for A. S. Brock Rubber Co., Boston, Mass.)

CONNECTORS, LAMP—See Connectors, Acetylene Lamp; also Connectors, Electric Lamp

CONNECTORS, TRACTOR—See Clevises, Automatic Tractor

CONNECTORS, TRAILER—See Couplers, Trailer

CONSULTING ENGINEERS — See Engineers, Consulting

CONTRACT WORK—See Machine Work; also Screw Machine Products; also Stampings

CONTRACTING BRAKES—See Brakes, Expanding and Contracting

CONTRACTING BRAKES FOR FORDS—See Brakes, Emergency Contracting

CONTROL LEVER BALLS—See Balls, Composition Control Lever

CONTROL LEVERS—See Levers, Brake

CONTROL RODS FOR FORDS—See Rods, Gasoline Cock Control

CONTROLLERS, Electric Motor

(For varying speed of electric vehicles)

Briggs & Stratton Co., Hopkins & Lewis Sts., Milwaukee, Wis.

Cutler Hammer Mfg. Co., 890 St. Paul Ave., Milwaukee, Wis.

General Electric Co., Schenectady, N. Y. (See pages 564 and 565.)

Industrial Controller Co., 886 Greenbush St., Milwaukee, Wis.

Western Electric Co., 463 West St., New York, N. Y.

Westinghouse Electric & Mfg. Co., (E. Liberty), Pittsburgh, Pa.

CONTROLLERS, Radiator Temperature, for Fords—See Covers or Shields, Automatic Radiators

CONTROLS, Clutch, for Fords

(Attachment for defining or indicating the neutral position of the clutch)

Junior—See New York Coil Co.

Lewi Clutch Control Co., 296 Lark St., Albany, N. Y.

Marion Metal Products Co., Marion, Ind.

New York Coil Co., 338-40 Pearl St., New York. N. Y. "Junior."

Shannon & Co., John, Stonington, Conn.

CONTROLS, Dash and Steering Column Carburetor

(For changing adjustment of carburetor from seat or operating choker for starting; See also Carburetors)

Breeze Mfg. Co., 250-52 South St., Newark, N. J.

CONTROLS, Ignition Switch, for Fords

(Attachment for operating the Ignition Switch from the Steering Wheel)

Gibson Control Co., West Alexander, Pa.

CONVERTERS, Chassis

(For connecting standard cars for truck and tractor purposes; for converters for Ford cars—See Converters, Chassis, for Fords.)

All-Car Unit Co., Real Estate Trust Bldg., Philadelphia, Pa.

American Truck & Tractor Co., 4172 Ogden Ave., Chicago, Ill.

Ames Co., F. A., Owensboro, Ky. "Ameston." (See pages 214A and 214B.)

Amesbury—See Jackson Motor Car Co.

Ameston—See Ames Co.

Auto-Motive Tractor Corp. of America, Southwest Bldg., Kansas City, Mo.

Barber Motor Corp., 47-49 Lincoln Pl., Brooklyn, N. Y.

Blount Carriage & Buggy Co., Atlanta, Ga.

Burlington Motor Truck Co., 711 Origen St., Burlington, Wis.

Carrier Motor Truck Co., 1685 Gratiot Ave., Detroit, Mich. "Detroit."

Commercial Car Unit Co., Philadelphia, Pa.

Curtis Form-A-Tractor Co., 6 N. Clark St., Chicago, Ill.

Dearborn Truck Co., 2515-25 W. 35th St., Chicago, Ill.

Detroit—See Carrier Motor Truck Co.

Detroit Truck Co., Detroit, Mich.

E. & W. Mfg. Co., Oregon St., Milwaukee, Wis. "Three-in-One." (See page 215.)

Globe Machinery & Supply Co., 205-11 W. Court Ave., Des Moines, Ia.

Guaranteed Tractors, 2500 Cottage Grove Ave., Chicago, Ill.

Guaranty Motors Co., 864-68 Main St., Cambridge, Mass.

Iowa Motor Truck Co., 112 S. Court St., Ottumwa, Iowa.

Jackson Motor Car Co., 1109 Commonwealth Ave., Boston, Mass. (Sole Distributors for Unit Mfg. Co., Amesbury, Mass.) "Amesbury."

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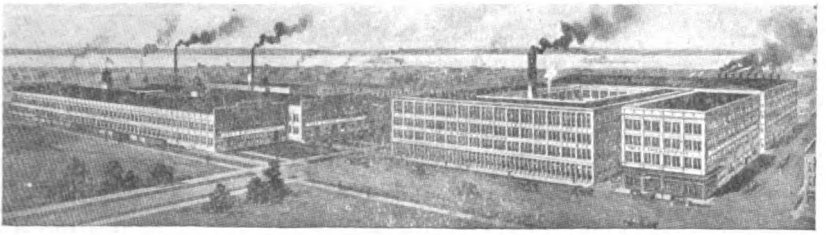
THE FACTORY BEHIND *Amesbilt* PRODUCTS



The illustration above shows a picture of progress—the final achievement of 36 years, solving the problems of road transportation.

When horse transportation was the vogue, the name of "Ames" on a wagon or carriage was accepted as the symbol of honest workmanship, highest class of material and sold at a price that was fair to all.

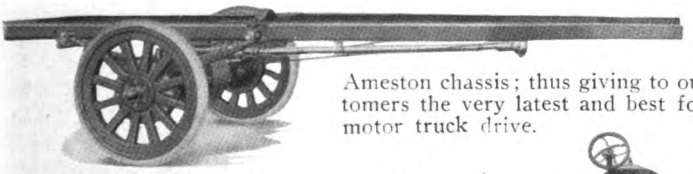
With the passing of the years the horse has given place to the gasoline motor—but the symbol that meant so much to the horse vehicles that carried the name of Ames—still stands untarnished by the hand of time and is thus going forth into the broadened field of motor transportation that the world shall know "Amesbilt products" and who makes them.

In a word—we are proud of our name, our years of progress and past success and present-day achievement.

Ameston Worm Drive Truck Unit

Just a word to remind you that the worm as a final type of drive has increased from 1% in 1913 to over 65% today, also that the United States Liberty Truck is worm drive.

Following in the path of progress we have adapted the worm drive for



Ameston chassis; thus giving to our customers the very latest and best form of motor truck drive.

Ameston units are made in two models for Fords and other makes of cars.

The saving of an Ameston job over the average 1½-ton worm drive truck is at least $1,000.

With these facts and figures before you it should be an easy matter for you to sell Ameston Worm Drive Truck Units to any one who is in the market for a 1½-ton truck.

The F. A. Ames Co., Incorporated, Owensboro, Ky.

TRUCK UNIT DEPARTMENT

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Amesbilt PRODUCTS

Ames Commercial Unit

By attaching an Ames Commercial Unit to any Ford Chassis it is possible to increase the wheel base to either 115 or 130 inches, thus producing a shaft drive delivery car of 2,000 lbs. capacity—and you still have the economical "Ford" motor and transmission.

This "extension" opens up a vast field to dealers, especially in these war times when "no more new Ford cars are being built."

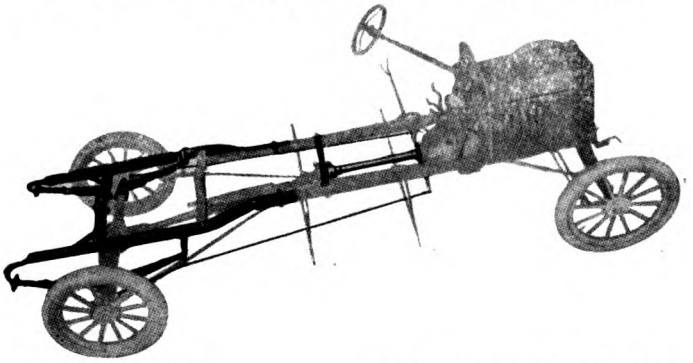
You have only to ask yourself where the "delivery cars" are coming from for 1919—and you have the answer.

The Ames Commercial Unit will solve the problem of "delivery car shortage."

Every Ford car now running can be turned into a "delivery car" and thus save the day for the small merchant.

Here and "now" is the opportunity for automobile dealers and garage owners to make money "during these war times" selling every merchant in their town an Ames Commercial Unit.

We make a "Unit" to fit each business need, as explained below.



Model 00-2

This model widens the Ford frame from 23" to 34" over rear axle. While it does not lengthen the wheel base, the Commercial Unit frame extends 16½" further than Ford frame. The two semi-elliptic side springs reinforce the Ford cross spring and the Ford rear axle is strengthened by the use of a five thousand pound tensile strength truss rod.

This model is particularly adapted to hauling heavy loads without bulk.

Model 15-2-115 in. Wheel Base
Model 30-2-130 in. Wheel Base

These models lengthen the wheel base of the Ford to 115" and 130" respectively. In addition, the frame of each model extends 16½" over the rear axle, giving 31½" more loading space on Model 15-2 and 46½" more loading space on 30-2 than on the regular Ford.

The above models have no side springs. They are low priced and particularly adapted to large, bulky loads without excessive weight.

The F. A. Ames Co., Incorporated, Owensboro, Ky.

COMMERCIAL UNIT DEPARTMENT

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E and W
THREE IN
ONE
UNIT CAB BODY
TRUCK ATTACHMENT

E. & W. Truck Attachments

One-Two-Three-Ton

Internal Gear and Worm

Drive are sold with body and cab.

The E. & W. makes a heavy duty truck of any car, from a Ford to a Pierce-Arrow.

Dealers—Write for our proposition—Immediate Deliveries.

E. & W. Manufacturing Co.
Oregon Street
MILWAUKEE, WIS.

E G

Ignition Cable
Lamp Cord
Ford Assemblies
Fan Belts
Robe Rails
Spring Bumpers
Magneto Terminals
Foot Rails
Stay-On Oil Cock Wrenches
Mirrors

Quality Goods

Immediate Shipments
Write for Prices

E. G. Manufacturing Co., Inc.
250 West 54th St., New York

LAUTON TRUCK UNITS

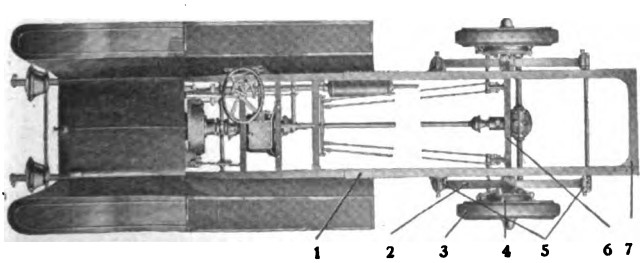
Torbensen Internal Gear Axle, standard make Pressed-On Tires, Perfection Springs, three-piece 4" channel frame and other features make this the sturdiest truck unit built. Backed by a financially strong company.

Write for Dealer Proposition.

Four Models

1 Ton for Fords
1½-2 Ton for Fords
1-1½ Ton Universal
1½-2 Ton Universal

THE LAUTON TRUCK CO.
Youngstown, Ohio



1—18" overlap of frame
2—Perfection Springs
3—Ample Tires
4—15x3" brake drum
5—Strongest Spring Brackets
6—Drop-forged I-beam axle
7—One-piece rear frame member

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CONVERTERS, Chassis (Cont'd)

Kelly Convertible Auto Truck Co., 332 S. Michigan Ave., Chicago, Ill.

Knox Motors Co., 53 Wilbraham Rd., Springfield, Mass.

Lauton Truck Co., Youngstown, O. (See page 215.)

Maxfer Truck & Tractor Co., 147th St. & Page Ave., Harvey, Ill.

No-Chain Truck Unit Co., 3302-04 Lawton Ave., St. Louis, Mo.

Partford—See Partlow-Jenkins Motor Car Co.

Partlow-Jenkins Motor Car Co., 319-23 E. Market St., Indianapolis, Ind. "Partford."

Phenix Truck Makers, 4948 Bloomingdale Ave., Chicago, Ill.

Rayford Unit Co., Second St. & Indiana Ave., Philadelphia, Pa.

Robinson Machine Co. (Ecorse), Detroit, Mich. "Truckford."

Royal Machine Co., Cincinnati, O.

Simpson Truck Co., St. Joseph, Mich. "Victor."

Sheet Metal Specialty Co., Goshen, Ind.

Smith Motor Truck Corp., Michigan Ave. & 16th St., Chicago, Ill.

Staude Mfg. Co., E. G., 2675 W. University Ave., St. Paul, Minn.

Three-in-One—See E. & W. Mfg. Co.

Truckford—See Robinson Machine Co.

Unit Mfg. Co.—See Jackson Motor Car Co.

Victor—See Simpson Truck Co.

Waco Mfg. Co., 705 Delaware St., Kansas City, Mo.

Western Truck Attachment Co., 1510 11th Ave., Seattle, Wash.

CONVERTERS, Chassis, for Fords

(For converting the Ford chassis for truck and tractor purposes; for converters for other cars—See Converters, Chassis.)

Adapto—See Geneva Tractor Co.

All-Car Unit Co., Real Estate Trust Bldg., Philadelphia, Pa.

American Ford-A-Tractor Co., Kasota Bldg., Minneapolis, Minn.

American Truck & Tractor Co., 4172 Ogden Ave., Chicago, Ill.

Ames Co., F. A., Owensboro, Ky. "Amesbilt." (See pages 214A and 214B.)

Amesbilt—See Ames Co.

Amesbury—See Jackson Motor Car Co.

Ameston—See Ames Co.

Andaford Truck Co., Jefferson & McDougall Aves., Detroit, Mich.

Arnold Motor Car Co., 191-207 Paterson St., Paterson, N. J.

Auto Pull—See Wedge Implement Co.

Axleford Truck Co., 4074 Broadway, Chicago, Ill.

Barber Motors Corp., 47-49 Lincoln Pl., Brooklyn, N. Y.

Blount Carriage & Buggy Co., Atlanta, Ga.

Browntruck—See Woodward & Rowe.

Burlington Motor Truck Co., 711 Origen St., Burlington, Wis.

Camelford—See Maremont Mfg. Co.

Carrier Motor Truck Co., 1685 Gratiot Ave., Detroit, Mich. "Detroit."

Champion Motors Co., 2500 Cottage Grove Ave., Chicago, Ill.

Chicago Pneumatic Tool Co., 1039 Fisher Bldg., Chicago, Ill. "Giant." (See page 259.)

Columbia—See Wentworth & Irwin.

Comdelvar—See Longford Co. of America.

Commercial Car Unit Co., Philadelphia, Pa. "Truxton."

Consolidated Truck & Tractor Co., 976 Woodward Ave., Detroit, Mich.

Convertible Tractor Corp., 1485 Marshall Ave., St. Paul, Minn. "Me-Go."

Curtis Form-A-Tractor Co., 6 N. Clark St., Chicago, Ill.

Day-Hamlin Mfg. Co., Jackson, Mich.

Dearborn Truck Co., 2515-25 W. 35th St., Chicago, Ill.

Detroit—See Carrier Motor Truck Co.

Detroit Truck Co., Detroit, Mich. "Tonford."

E. & W. Mfg. Co., Oregon St., Milwaukee, Wis. "Three-in-One." (See page 215.)

Feeney Mfg. Co., Washington St. & Ohio Ave., Muncie, Ind.

Fond du Lac Tractor Co., 66 S. May St., Fond du Lac, Wis.

Forbes, Walter J., 242 Columbus Ave., Boston, Mass.

Franklin 2 Way Converter Co., Herald Bldg., Chicago, Ill.

Geneva Tractor Co., 8 Factory Row, Geneva, O. "Adapto."

Giant—See Chicago Pneumatic Tool Co.

Globe Machinery & Supply Co., 205-11 W. Court Ave., Des Moines, Ia.

Graham Bros., Dept. L, Evansville, Ind. (See page 45.)

Greb Co., 195 State St., Boston, Mass. "Grebford," "P. B. B." (See page 531.)

Grebford—See Greb Co.

Guaranteed Tractors, 2500 Cottage Grove Ave., Chicago, Ill.

Guaranty Motors Co., 864-68 Main St., Cambridge, Mass.

Hay-Dee—See Hayes-Diefenderfer Co.

Hayes-Diefenderfer Co., 1876 Broadway, New York, N. Y. "Hay-Dee."

Hedden Place Machine Co., East Orange, N. J. "Stevenson."

Hendricks Mfg. Co., First Ave., S., Seattle, Wash.

Hoosier—See Sheet Metal Specialty Co.

Hoover Wagon Co., York, Pa. (See page 219.)

Horne Quick-Change Tractor Co., Detroit, Mich.

Indestructible Truck Co., Lebanon, Ind.

Iowa Motor Truck Co., 112 S. Court St., Ottumwa, Ia.

Ita Manufacturers, Glen Ellyn, Ill. (See page 495.)

Jackson Motor Car Co., 1109 Commonwealth Ave., Boston, Mass. (Sole Distributors for Unit Mfg. Co., Amesbury, Mass.. "Amesbury.")

Jewett Truck Attachment Co., Newark, O. (See page 217.)

Jiffy—See Northfield Iron Co.

Keystone Machine Co., York, Pa. "Multa-Power."

Kelly Convertible Auto Truck Co., 332 S. Michigan Ave., Chicago, Ill.

Knickerbocker Motors, 170 Broadway, New York, N. Y.

Knox Motors Co., 53 Wilbraham Rd., Springfield, Mass.

L. & B. Truck Mfg. Co., 1416 S. Los Angeles St., Los Angeles, Cal.

Lakeside Motor Truck Co., 2210 S. Michigan Ave., Chicago, Ill.

Landover Auto Truck Co., Marinette, Wis.

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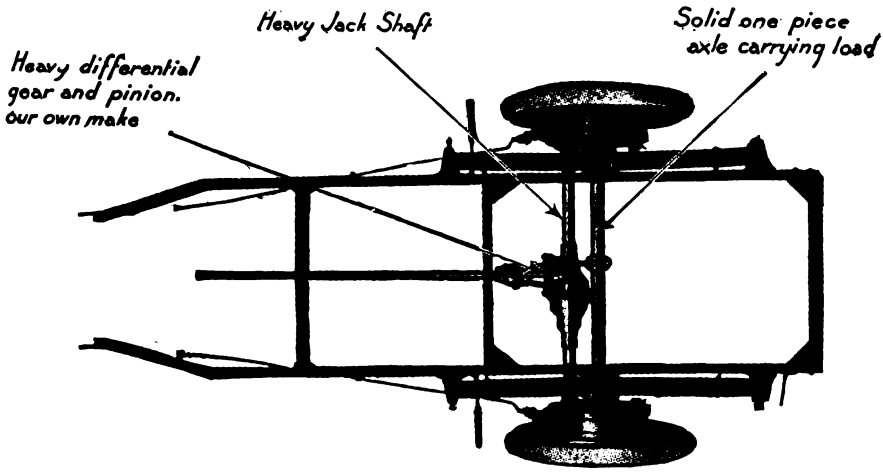
This JEWETT Attachment and a Ford Chassis will form a One Ton Truck



Top View of Jewett Attachment Showing Unusual, Special, Practical Features

The Light Truck Proposition SOLVED with The Jewett Attachment and a Ford Chassis

Our attachment consists of an internal drive rear axle, heavy rear wheels with 32x3½ solid tires, drive shaft and universal joints.

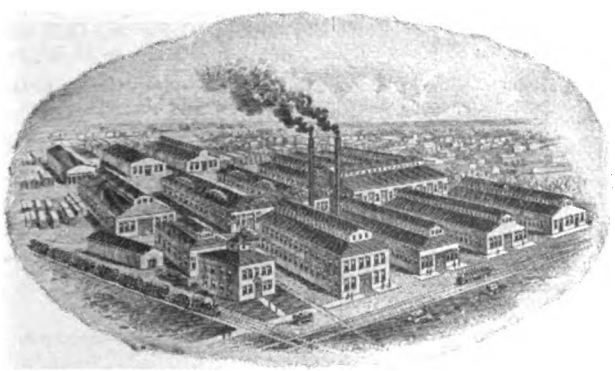
Can be assembled by anyone in a few hours' time.

This is the only attachment that includes everything necessary to form a complete truck.

This entire attachment made complete here in our own plant.

No experiment but a tried-out mechanical success.

An Internal Gear Drive—Not a Chain Drive



The Plant Behind the Truck

List price, $360.00
F. O. B.
NEWARK, OHIO

Wonderful Opportunity for Live Dealers. Grasp it Quick. Write Us Immediately for Our Liberal Offer to Agents.

The Jewett Truck Attachment Company

NEWARK, OHIO, U. S. A.

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CONVERTERS, Chassis, for Fords (Continued)

Lauton Truck Co., Youngstown, O. (See page 215.)

Longford Co. of America, 80 Charles River Rd., Cambridge, Mass. "Comdelvar." (See page 219.)

Los Angeles Motor Car Co., 1410 Cypress Ave., Los Angeles, Cal.

Lucke-Douglas Co., 26 Wilder St., Minneapolis, Minn.

McIntyre Motor Products Co., 100-10 W. 55th St., Chicago, Ill.

Mak-A-Tractor—See Staude Mfg. Co.

Maremont Mfg. Co., 916-18 S. Wabash Ave., Chicago, Ill. "Camelford."

Master Equipment Co., 2200 S. Main St., Los Angeles, Cal.

Maxfer Truck & Tractor Co., 147th St. & Page Ave., Harvey, Ill.

Me-Go—See Convertible Tractor Corp.

Multa-Power—See Keystone Machine Co.

No-Chain Truck Unit Co., 2302-04 Lawton Ave., St. Louis, Mo.

Northfield Iron Co., Jiffy Bldg., Northfield, Minn. "Jiffy."

Odell One-Ton Truck Attachment Co., Atlanta, Ga.

Olin Gas Engine Co., 10-16 Lock St., Buffalo, N. Y.

Olson—See Swedish Crucible Steel Co.

Oxford Truck Co., Fifth & Hodgson Sts., Oxford, Pa.

P. B. B.—See Greb Co.

Partford—See Partlow-Jenkins Motor Car Co.

Partlow-Jenkins Motor Car Co., 319-23 E. Market St., Indianapolis, Ind. "Partford."

Phenix Truck Makers, 4948 Bloomingdale Ave., Chicago, Ill.

Pullford Co., Quincy, Ill.

Rayford Unit Co., Second St. & Indiana Ave., Philadelphia, Pa.

Redden Motor Truck Co., 2337 S. Michigan Ave., Chicago, Ill.

Robinson Machine Co. (Ecorse), Detroit, Mich. "Truckford."

Robinson Motor Truck Co., Second Ave., N., & Seventh St., Minneapolis, Minn. "Utility."

Royal Machine Co., Cincinnati, O.

Scott Machine Works, 1510 11th Ave., Seattle, Wash.

Selden Mfg. Co., 29 Selden Ave., Detroit, Mich.

Sheet Metal Specialty Co., Goshen, Ind. "Hoosier."

Simpson Truck Co., St. Joseph, Mich. "Victor."

Smith Motor Truck Corp., Michigan Ave. & 16th St., Chicago, Ill.

Standard-Detroit Tractor Co., 1506 Fort St., W., Detroit, Mich. "Traceford."

Staude Mfg. Co., E. G., 2675 W. University Ave., St. Paul, Minn. "Mak-A-Tractor."

Stevenson—See Hedden Place Machine Co.

Stewart Mfg. Co., 124 Rath St., Waterloo, Ia.

Swedish Crucible Steel Co., Butler St. & G. T. R. R., Detroit, Mich. "Olson."

Three-in-One—See E. & W. Mfg. Co.

3 P Auto Tractor Co., 513 E. Fourth St., Davenport, Ia.

Tonford—See Detroit Truck Co.

Trackford—See Standard-Detroit Tractor Co.

Truck Attachment Co., Seattle, Wash. "Wright."

Truckford—See Robinson Machine Co.

Truxton—See Commercial Car Unit Co.

U-Can-A-Ford—See Wardway Vehicle Works.

Union Truck Co., 250 W. 54th St., New York, N. Y.

Unit Mfg. Co.—See Jackson Motor Car Co.

United Auto Dealers Mfg. Co., 931-43 Bergen St., Brooklyn, N. Y.

UniTractor Co., 377 N. Cicero Ave., Chicago, Ill.

Unity Motor Truck Co., Cleveland, O.

Universal Equipment Co., 253 Broadway, New York, N. Y.

Utility—See Robinson Motor Truck Co.

Victor—See Simpson Truck Co.

Waco Mfg. Co., 705 Delaware St., Kansas City, Mo.

Wardway Vehicle Works, Chicago Heights, Ill. "U-Can-A-Ford." (See page 715.)

Wayne Works, Richmond, Ind.

Wedge Implement Co., 414 S. Third St., Minneapolis, Minn. "Auto Pull."

Wentworth & Irwin, 200 Second St., Portland, Ore. "Columbia."

Western Truck Attachment Co., 1510 11th Ave., Seattle, Wash.

Will-Holl—See Wilson-Holland Mfg. Co.

Wilson-Holland Mfg. Co., Gratiot Ave. & French Rd., Detroit, Mich. "Will-Holl."

Wiseman-Elliott Mfg. Co., El Paso, Tex.

Woodward & Rowe, 2125 Michigan Ave., Chicago, Ill. "Browntruck."

Wright—See Truck Attachment Co.

Xtend-A-Ford Co., 1610 Glenwood Ave., Philadelphia, Pa.

CONVERTERS, TRUCK—See Converters, Chassis

COOLERS, WATER—See Radiators, Water Cooling

COOLING FANS—See Fans, Radiator

COPPER CASTINGS—See Castings, Bronze and Brass

COPPER GASKETS—See Gaskets, Metallic

COPPER GASKETS FOR FORDS—See Gaskets, Cylinder Head

COPPER HAMMERS—See Hammers, Brass and Copper

COPPER MALLETS—See Hammers, Brass and Copper

COPPER MELTING FURNACES—See Furnaces, Brass and Copper Melting

COPPER RIVETS—See Rivets, Brass

COPPER, ROD—See Brass, Sheet

COPPER, SHEET—See Brass, Sheet

COPPER, TUBE—See Tubing, Brass

CORD, Aeroplane Rubber

Dural Rubber Corp., Maple Ave., Flemington, N. J.

Narrow Fabric Co., Reading, Pa.

Rusco—See Russell Mfg. Co.

Russell Mfg. Co., Middletown, Conn. "Rusco." (See page 415.)

United States Tire Co., Broadway & 58th St., New York, N. Y. "Usco." (See page 695.)

Usco—See United States Tire Co.

Whitely Exerciser Co., 36 Vesey St., New York, N. Y.

Wood Elastic Web. Co., J. W., Stoughton, Mass.

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THE Hoover EXTENSION

For increasing the wheelbase of the Ford Chassis so it will accommodate a body having a larger loading space. The most complete outfit of its kind on the market.

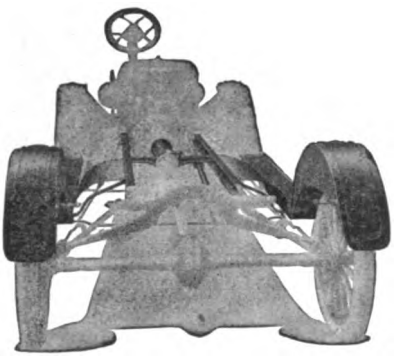
"The only extension that provides a rigid frame and is equipped with an adjustable supporting bracket."

—

Not an experiment.

—

Fully Guaranteed.



Made in three lengths:

18 inches
24 inches
30 inches

—

For additional information and Dealer's proposition,

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CORD, RUBBER — See Cord, Aeroplane Rubber

CORD SEAMING

Meyer & Co., John C., Lowell, Mass.

CORE COMPOUNDS—See Compounds, Core

CORE HOLE PLUGS—See Plugs, Core Hole

CORED BARS—See Metals, Bearing

CORES, SPARK PLUG—See Lava; also Mica; also Porcelain

CORES, TIRE VULCANIZING—See Molds, Tire Vulcanizing

CORK Brake and Clutch Inserts

Armstrong Cork Co., 133 23d St., Pittsburgh, Pa.

Cork Insert Co., 164 Federal St., Boston, Mass.

Diamond Cork Co., 59 Pearl St., New York, N. Y.

Mundet & Son, L., King, Ferris & Sullivan Sts., Brooklyn, N. Y.

Paddock Cork Co., 1209-17 De Kalb Ave., Brooklyn, N. Y. (See page 325.)

Spanish-American Cork Co., 2211 Pennsylvania Ave., Baltimore, Md.

CORK FLOATS—See Floats, Cork

CORK GASKETS FOR FORDS—See Gaskets, Cork

CORK PULLEY COVERS—See Covers, Cork Pulley Rim

CORK WASHERS—See Washers, Cork

COST SYSTEM BOOKS—See Books, Accounting

COST SYSTEMS—See Books, Accounting

COTTER PIN PULLERS—See Pullers, Cotter Pin

COTTER PINS—See Pins, Cotter

COTTERS, SPLIT—See Pins, Cotter

COTTON BELTS — See Belts, Endless Fabric

COTTON FELT UPHOLSTERY—See Moss, Upholstery

COTTON TIRE FABRICS—See Fabric, Cotton Tire

COTTON WASTE—See Waste, Cotton

COUCHES, REPAIR—See Trucks, Repair

COUNTERBALANCES, Crankshaft, for Fords

Dunn Counterbalance Co., 155 N. 15th St., Clarinda, Ia.

COUNTER-SHAFTS, Finished

Ball—See New York Gear Works.

Durston Gear Co., 21 Maltby St., Syracuse, N. Y.

Liggett Spring & Axle Co., Monongahela, Pa

New York Gear Works, 56 Greenpoint Ave., Brooklyn, N. Y. "Ball."

Russell Motor Axle Co., North Detroit, Mich.

Timken-Detroit Axle Co., Detroit, Mich.

COUPLERS, Trailer

Brice Automatic Coupler Co., 1645 Hennepin Ave., Minneapolis, Minn.

Fernald Mfg. Co., North East, Pa. "Quick-Hitch."

Quick-Hitch—See Fernald Mfg. Co.

COUPLERS, Trailer, for Fords

Brice Automatic Coupler Co., 1645 Hennepin Ave., Minneapolis, Minn.

Eberhard Mfg. Co., 2734 Tennyson Rd., Cleveland, O.

Litehaul—See Puffer-Hubbard Mfg. Co.

Puffer-Hubbard Mfg. Co., 26th St. & 32d Ave., S. Minneapolis, Minn. "Litehaul."

COUPLINGS, Automatic Spark Advancing

Automatic Spark Advance Co., Monadnock Bldg., San Francisco, Cal. "Newton."

Newton—See Automatic Spark Advance Co.

COUPLINGS, BELT—See Fasteners, Belt

COUPLINGS, CLUTCH — See Couplings, Motor Boat Clutch

COUPLINGS, COMPRESSION—See Unions, Tubing

COUPLINGS, FLANGE — See Couplings, Motor Boat Flange

COUPLINGS, FLEXIBLE—See Couplings, Motor Boat Flexible

COUPLINGS, HOSE—See Clamps, Hose

COUPLINGS, Magneto

Acme Motor Parts, 1454 Eighth Ave., Milwaukee, Wis.

Bailey Co., Geo. D., 4500 Ravenswood Ave., Chicago, Ill. "RC"

Blair & Co., F. R., 50 Church St., New York, N. Y. "Flexite."

Bosch Magneto Co., 223 W. 46th St., New York, N. Y.

Clark—See Dexter Co.

Climax Motor Devices Co., 5200 Euclid Ave., Cleveland, O.

Dexter Co., I. H., 27 Walker St., New York, N. Y. "Clark."

Eisemann Magneto Co., 32-33d St., Brooklyn, N. Y. (See page 443.)

Flexite—See Blair & Co.

Hardy—See Thermoid Rubber Co.

Nelson Mfg. Co., A., 2700 Southport Ave., Chicago, Ill.

RC—See Bailey Co.

Swiss Magneto Co., Monroe, Mich.

Thermoid Rubber Co., Trenton, N. J. "Hardy." (See pages 373 and 397.)

Universal Motor Co., 39 Ceape St., Oshkosh, Wis.

Werner Coupling Co., 931 Dauphin St., Philadelphia, Pa.

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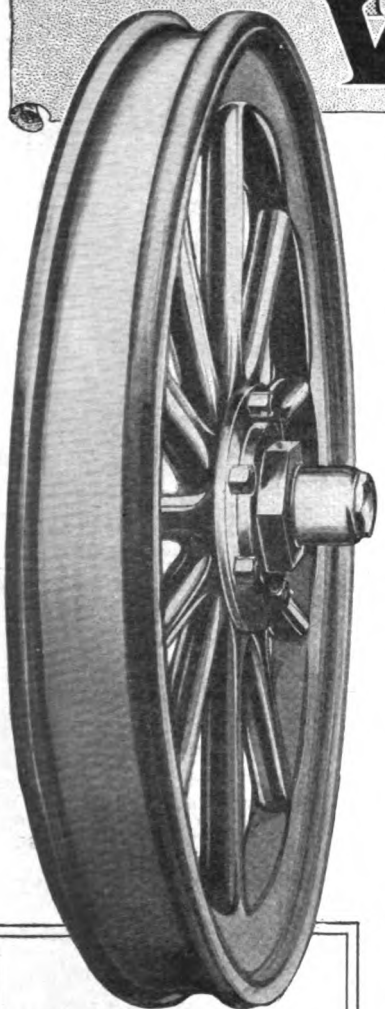

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The Minute Wheel equipment consists of four Minute Hubs, an extra wheel with special flanges and a Minute Wrench. The extra wheel can be front or rear and used interchangeably for the outside diameter is the same for both, 30x3 and 30x3½ inches.

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COUPLINGS, Motor Boat Clutch

List Mfg. Co., E. J., Havana, Ill.

COUPLINGS, Motor Boat Flange

Nilson-Miller Co., 13th & Hudson Sts., Hoboken, N. J.

COUPLINGS, Motor Boat Flexible

Dexter Co., I. H., 27 Walker St., New York, N. Y.

Johnson Machine Co., Carlyle, 52 Main St., Manchester, Conn.

Smith-Serrell Co., West St. Bldg., New York, N. Y.

COUPLINGS, PIPE—See Fittings, Pipe

COUPLINGS, SOLDERLESS—See Unions, Tubing

COUPLINGS, SPARK ADVANCING—See Couplings, Automatic

COUPLINGS, TUBE—See Unions, Tubing

COVERS, AUTOMATIC RADIATOR—See Covers or Shields, Automatic Radiator

COVERS, Automobile

(For covering automobiles when in the garage)

Atlas Specialty Mfg. Co., 16-22 E. 24th St., Chicago, Ill. (See page 123.)

Chicago Wholesale Saddlery & Mfg. Co., 125-27 N. Halsted St., Chicago, Ill.

Dafoe-Eustice Co., 1164-72 W. Jefferson Ave., Detroit, Mich. "Duk-Bak," "Deco." (See page 227.)

Deco—See Dafoe-Eustice Co.

Duk-Bak—See Dafoe-Eustice Co.

Ero Mfg. Co., 700 W. 22d St., Chicago, Ill.

Fulton Bag & Cotton Mills, Atlanta, Ga. "Shuredry."

Greater N. Y. Auto Cover Co., 3783 Third Ave., New York, N. Y.

Humphrys Sons, R. A., 1021-23 Callowhill St., Philadelphia, Pa.

Landers Bros. Co., Blucher & Buckingham Sts., Toledo, O.

Nathan Novelty Mfg. Co., 84-90 Reade St., New York, N. Y. (See page 153.)

Niagara Fabric Mfg. Co., 47 Greene St., New York, N. Y.

Reach Textile Co., A. L., 133 Pearl St., Boston, Mass.

Royal Textile Co., 200 Congress St., Boston, Mass.

Schott Bros. Co., Buckeye & Main Sts., West Salem, O.

Shuredry—See Fulton Bag & Cotton Mills.

Warden Co., Geo. J., 6530-34 Carnegie Ave., Cleveland, O.

COVERS, CANVAS SHIPPING—See Covers, Paper

COVERS, Cork Pulley Rim

(For covering fan pulleys to prevent belt slipping)

Armstrong Cork Co., 133 23d St., Pittsburgh, Pa.

COVERS, HOOD—See Covers, Radiator

COVERS, JOINT—See Boots, Steering Knuckle

COVERS, Lamp

(Leather or fabric covers for head or side lamps)

B. E. Mfg. Co., 18-22 W. 18th St., New York, N. Y. (See page 223.)

Chicago Wholesale Saddlery & Mfg. Co., 125-27 N. Halsted St., Chicago, Ill.

Economy Stay Co., Jefferson City, Mo.

Gifford & Son, John A., 25 Park Pl., New York, N. Y. "Tompkins."

Gilbert Mfg. Co., 70-80 Center St., New Haven, Conn.

Landers Bros. Co., Blucher & Buckingham Sts., Toledo, O.

Nathan Novelty Mfg. Co., 84-90 Reade St., New York, N. Y. (See page 153.)

Niagara Fabric Mfg. Co., 47 Greene St., New York, N. Y.

Premier Auto Novelty Mfg. Co., 375 W. Broadway, New York, N. Y.

Tompkins—See Gifford & Son.

COVERS, Magneto

(Leather or Fabric Covers)

Atlas Specialty Mfg. Co., 16-22 E. 24th St., Chicago, Ill. (See page 123.)

B. E. Mfg. Co., 18-22 W. 18th St., New York, N. Y. (See page 223.)

Bailey Co., R. B., 1316 S. Grand Ave., Los Angeles, Cal.

Campbell—See Perkins-Campbell Co.

Chicago Wholesale Saddlery & Mfg. Co., 125-27 N. Halsted St., Chicago, Ill.

Dafoe-Eustice Co., 1164-72 W. Jefferson Ave., Detroit, Mich. "Duk-Bak," "Deco." (See page 227.)

Deco—See Dafoe-Eustice Co.

Duk-Bak—See Dafoe-Eustice Co.

Economy Stay Co., Jefferson City, Mo.

Gilbert Mfg. Co., 70-80 Center St., New Haven, Conn.

Hager & Son, Chas., 1926 Broadway, New York, N. Y.

Hoover Co., W. H., New Berlin, O.

Nathan Novelty Mfg. Co., 84-90 Reade St., New York, N. Y. (See page 153.)

Niagara Fabric Mfg. Co., 47 Greene St., New York, N. Y.

Perkins-Campbell Co., 634 Broadway, Cincinnati, O. "Campbell." (See page 227.)

Reinhold Belting & Supply Co., 499 Atlantic Ave., Brooklyn, N. Y.

Smith & Son, James, 40-42 Franklin Ave., Brooklyn, N. Y.

Springfield Harness Co., 55-61 Dwight St., Springfield, Mass.

Stevens & Bro., A. A., 1224 Wabash Ave., Chicago, Ill.

Sutherland Co., F. L., 139 Beaubien St., Detroit, Mich. (See page 523.)

COVERS, Oil Hole

(Stamped or turned metal dustproof covers for oil holes)

Bay State Stamping Co., 380 Chandler St., Worcester, Mass. "Bennett," "Handy."

Bennett—See Bay State Stamping Co.

Bowen Products Corp., Auburn Division, Auburn N. Y. "Empress." (See page 237.)

Bowen Products Corp., 866 Warren Ave., W., Detroit, Mich. (See page 121.)

Detroit Lubricator Co., Trumbull & Grand Trunk R. R., Detroit, Mich.

Empress—See Bowen Products Corp.

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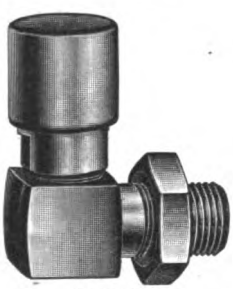

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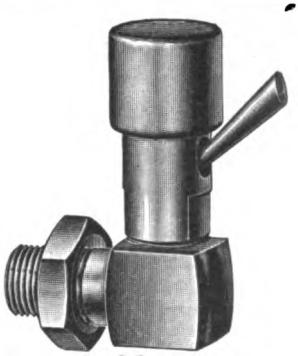

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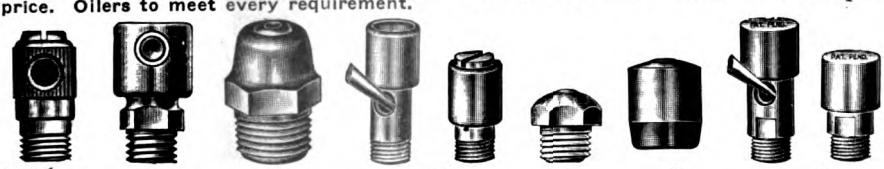

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COVERS, Oil Hole (Continued)

Gits Bros. Mfg. Co., 1940 Kilbourne Ave., Chicago, Ill.

Greer, Frederic, 525 W. Van Buren St., Chicago, Ill.

Handy—See Bay State Stamping Co.

Keeler Brass Co., 261-71 Godfrey Ave., Grand Rapids, Mich.

Long Bros., Broadway & Buckeye St., Kokomo, Ind.

Tucker, W. H. & C. F., Hartford, Conn. (See page 223.)

Wahlstrom Tool Co., 5520 Second Ave., Brooklyn, N. Y.

COVERS, Paper and Canvas Shipping

(For protecting cars during shipment)

Kennedy Car Liner & Bag Co., Shelbyville, Ind. (See page 271.)

Safepack Paper Mills, 727 Atlantic Ave., Boston, Mass.

Seinsheimer Paper Co., York St. & McLean Ave., Cincinnati, O.

United States Tent & Awning Co., 229 N. Desplaines St., Chicago, Ill.

COVERS, PULLEY RIM—See Covers, Cork Pulley Rim

COVERS, Radiator and Hood

(To prevent the water freezing in cold weather)

Allen Auto Specialty Co., 16 W. 61st St., New York, N. Y. (See page 229.)

Antidam—See Glover Equipment Co.

Arctic—See Cincinnati Auto Specialty Co.

Atlas Specialty Mfg. Co., 16-22 E. 24th St., Chicago, Ill. (See page 123.)

B. E. Mfg. Co., 18-22 W. 18th St., New York, N. Y. "Bemco." (See page 223.)

Badger—See Wisconsin Auto Top Co.

Baker & Lockwood Mfg. Co., Seventh & Wyandotte Sts., Kansas City, Mo.

Bemco—See B. E. Mfg. Co.

Bestfront—See Holden Mfg. Co.

Buob & Scheu, 500-10 Webster Ave., Cincinnati, O. (See page 711.)

Campbell—See Perkins-Campbell Co.

Central Auto Top Co., 421-25 N. Capitol Ave., Indianapolis, Ind.

Chicago Wholesale Saddlery & Mfg. Co., 125-27 N. Halsted St., Chicago, Ill.

Cincinnati Auto Specialty Co., 426 Elm St., Cincinnati, O. "Frost King," "Arctic."

Co-Zee—See Omaha Auto Top Co.

Dafoe-Eustice Co., 1164-72 W. Jefferson Ave., Detroit, Mich. "Duk-Bak," "Deco." (See page 227.)

Deco—See Dafoe-Eustice Co.

Detroit Slip Cover Co., 22 Hendrie Ave., Detroit, Mich. "Pro-Tec-Shun."

Duk-Bak—See Dafoe-Eustice Co.

Ero Mfg. Co., 700 W. 22d St., Chicago, Ill.

Frost King—See Cincinnati Auto Specialty Co.

Genesee Mfg. Co., 516-18 Harrison St., Flint, Mich.

Gilbert Mfg. Co., 70-80 Center St., New Haven, Conn.

Glover Equipment Co., 412 N. Capital Ave., Indianapolis, Ind. "Antidam."

Gordon Co., J. P., 303 N. Fourth St., Columbus, O. "Jack Frost." (See page 225.)

Goss Co., J. C., 16 Woodbridge St., E., Detroit, Mich.

Holden Mfg. Co., 409 N. Franklin Ave., St. Paul, Minn. "Bestfront."

Invincible—See Peters & Herron Dash Co.

Jack Frost—See Gordon Co.

Knapp Co., A. C., 1735 Mt. Elliott Ave., Detroit, Mich.

Ladow, Clinton, Asbury Park, N. J. "Neptune."

McKinnon Dash Co., 252 Amherst St., Buffalo, N. Y. (See page 663.)

Martin Mfg. Co., Forest Rose Ave., Lancaster, O.

Monarch Carriage Goods Co., 2838-44 Spring Grove Ave., Cincinnati, O.

Motor Row Top Co., 1816-18 S. Fourth Ave., Rock Island, Ill. "Pearson's."

Myar Mfg. Co., 124 E. Fourth St., Little Rock, Ark.

Nathan Novelty Mfg. Co., 84-90 Reade St., New York, N. Y. (See page 153.)

Neptune—See Ladow, Clinton.

Niagara Fabric Mfg. Co., 47 Greene St., New York, N. Y.

Omaha Auto Top Co., 709-11 S. 15th St., Omaha, Neb. "Co-Zee."

Pearson's—See Motor Row Top Co.

Perkins-Campbell Co., 634 Broadway, Cincinnati, O. "Campbell." (See page 227.)

Peters & Herron Dash Co., Gift St., Columbus, O. "Invincible."

Premier Auto Novelty Mfg. Co., 375 W. Broadway, New York, N. Y.

Pro-Tec-Shun—See Detroit Slip Cover Co.

Robertson Auto Robe Co., 311 First Ave., N., Minneapolis, Minn.

Simon & Co., S. C., 404-12 Brown St., Philadelphia, Pa.

Vehicle Top & Supply Co., 3414 Lindell Ave., St. Louis, Mo. "Vesco."

Vesco—See Vehicle Top & Supply Co.

Wilcox Co., M. I., Water St., Toledo, O.

Wisconsin Auto Top Co., 1701 Hamilton Ave., Racine, Wis. "Badger." (See page 227.)

COVERS, Radiator and Hood, for Fords

(To prevent the water freezing in cold weather)

Arctic—See Cincinnati Auto Specialty Co.

Atlas Specialty Mfg. Co., 16-22 E. 24th St., Chicago, Ill. (See page 123.)

Ayers & Sons, Wm., Cumberland & Fourth Sts., Philadelphia, Pa.

B. E. Mfg. Co., 18-22 W. 18th St., New York, N. Y. "Bemco." (See page 223.)

Bemcó—See B. E. Mfg. Co.

Buob & Scheu, 500-10 Webster Ave., Cincinnati, O. (See page 711.)

Campbell—See Perkins-Campbell Co.

Chicago Wholesale Saddlery & Mfg. Co., 125-27 N. Halsted St., Chicago, Ill.

Cincinnati Auto Specialty Co., 426 Elm St., Cincinnati, O. "Frost King," "Arctic."

Copp Co., George W., 351-55 W. 52d St., New York, N. Y. (See page 227.)

Co-Zee—See Omaha Auto Top Co.

Ero Mfg. Co., 700 W. 22d St., Chicago, Ill.

Frost King—See Cincinnati Auto Specialty Co.

Gates Mfg. Co., 835 N. Meridian Ave., Indianapolis, Ind.

Gordon Co., J. P., 303 N. Fourth St., Columbus, O. "Jack Frost." (See page 225.)

H-M Mfg. Co., 122 S. Michigan Ave., Chicago, Ill. (See page 287.)

Harac Sales Co., Drexel Bldg., Philadelphia, Pa.

Holden Mfg. Co., 409 N. Franklin Ave., St. Paul, Minn.

Hopewell Bros., Watertown, Mass. (See page 229.)

Invincible—See Peters & Herron Dash Co.

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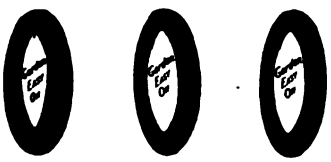

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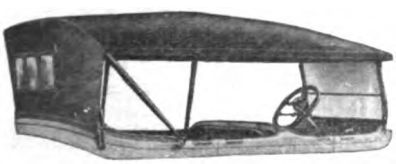

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COVERS, Radiator and Hood, for Fords (Continued)

Jack Frost—See Gordon Co.

Ladow, Clinton, Asbury Park, N. J. "Neptune."

McClellan, Chas. P., Fall River, Mass.

Myar Mfg. Co., 124 E. Fourth St., Little Rock, Ark.

Nathan Novelty Mfg. Co., 84-90 Reade St., New York, N. Y. (See page 153.)

Neptune—See Ladow, Clinton.

Omaha Auto Top Co., 709-11 S. 15th St., Omaha, Neb. "Co-Zee."

Perkins-Campbell Co., 634 Broadway, Cincinnati, O. "Campbell." (See page 227.)

Peters & Herron Dash Co., Gift St., Columbus, O. "Invincible."

Powers Mfg. Co., 1340 Sycamore St., Waterloo, Ia.

Premier Auto Novelty Mfg. Co., 375 W. Broadway, New York, N. Y.

Simon & Co., S. C., 404-12 Brown St., Philadelphia, Pa.

Wilcox Co., M. I., Water St., Toledo, O.

COVERS, RIM—See Covers, Spare Tire

COVERS, SEAT—See Covers, Slip

COVERS, SHIPPING—See Covers, Paper and Canvas Shipping

COVERS, Slip

(See also Tops, Automobile)

American Auto Top Co., 1451-53 Washington Blvd., Chicago, Ill.

Atlas Specialty Mfg. Co., 16-22 E. 24th St., Chicago, Ill. (See page 123.)

Auto Cape Top Co., 2334-38 S. Michigan Ave., Chicago, Ill.

B. E. Mfg. Co., 18-22 W. 38th St., New York, N. Y. (See page 223.)

Badger—See Wisconsin Auto Top Co.

Buob & Scheu, 500-10 Webster Ave., Cincinnati, O. (See page 711.)

Campbell—See Perkins-Campbell Co.

Central Auto Top Co., 421-25 N. Capitol Blvd., Indianapolis, Ind.

Chicago Auto Equipment Co., 808-10 W. Jackson Blvd., Chicago, Ill.

Co-Zee—See Omaha Auto Top Co.

Cooling Carriage Co., 402 French St., Wilmington, Del.

Copp Co., George W., 351-55 W. 52d St., New York, N. Y. (See page 227.)

Easy-On—See Gordon Co.

Ero Mfg. Co., 700 W. 22d St., Chicago, Ill.

Gates Mfg. Co., 835 N. Meridian Ave., Indianapolis, Ind.

Geco—See Glover Equipment Co.

Glover Equipment Co., 412 N. Capitol Ave., Indianapolis, Ind. "Geco."

Gordon Co., J. P., 303 N. Fourth St., Columbus, O. "Easy-On." (See page 225.)

Hartman-Townsend Co., 14th & West Sts., Indianapolis, Ind.

Herrity Co., E. A., 60 Summer St., Stamford, Conn.

Holden Mfg. Co., 409 N. Franklin Ave., St. Paul, Minn.

Hyatt Auto Top Co., 210-20 Wood St., Trenton, N. J.

Invincible—See Peters & Herron Dash Co.

Knapp Co., A. C., 1785 Mt. Elliott Ave., Detroit, Mich.

Mack Mfg. Co., Lancaster, Pa.

Moore & Co., 647 W. 50th St., New York, N. Y. "Right Fit."

Motor Row Top Co., 1816-18 S. Fourth Ave., Rock Island, Ill. "Pearson's."

Myar Mfg. Co., 124 E. Fourth St., Little Rock, Ark.

Nathan Novelty Mfg. Co., 84-90 Reade St., New York, N. Y. (See page 153.)

Niagara Fabric Mfg. Co., 47 Greene St., New York, N. Y.

Omaha Auto Top Co., 709-11 S. 15th St., Omaha, Neb. "Co-Zee."

Pearson's—See Motor Row Top Co.

Perkins-Campbell Co., 634 Broadway, Cincinnati, O. "Campbell." (See page 227.)

Peters & Herron Dash Co., Gift St., Columbus, O. "Invincible."

Premier Auto Novelty Mfg. Co., 375 W. Broadway, New York, N. Y.

Right Fit—See Moore & Co.

Warner Auto Top Co., 1622-26 Central Ave., Cincinnati, O.

Wheel Top & Hardware Co., 127 E. Eighth St., Cincinnati, O.

Wilcox Co., M. I., Water St., Toledo, O.

Wisconsin Auto Top Co., 1701 Hamilton Ave., Racine, Wis. "Badger." (See page 227.)

COVERS, Slip, for Fords

(See also Tops)

American Auto Top Co., 1451-53 Washington Blvd., Chicago, Ill.

Atlas Specialty Mfg. Co., 16-22 E. 24th St., Chicago, Ill. (See page 123.)

B. E. Mfg. Co., 18-22 W. 18th St., New York, N. Y. (See page 223.)

Badger—See Wisconsin Auto Top Co.

Co-Zee—See Omaha Auto Top Co.

Easy-On—See Gordon Co.

Ero Mfg. Co., 700 W. 22d St., Chicago, Ill.

Gates Mfg. Co., 832 N. Meridian Ave., Indianapolis, Ind.

Gordon Co., J. P., 303 N. Fourth St., Columbus, O. "Easy-On." (See page 225.)

Holden Mfg. Co., 409 N. Franklin Ave., St. Paul, Minn.

Invincible—See Peters & Herron Dash Co.

Ladow, Clinton, Asbury Park, N. J.

London Auto Supply Co., 2548 Wabash Ave., Chicago, Ill.

McClellan, Chas. P., Fall River, Mass.

Myar Mfg. Co., 124 E. Fourth St., Little Rock, Ark.

Nathan Novelty Mfg. Co., 84-90 Reade St., New York, N. Y. (See page 153.)

Omaha Auto Top Co., 709-11 S. 15th St., Omaha, Neb. "Co-Zee."

Perkins-Campbell Co., 634 Broadway, Cincinnati, O. (See page 227.)

Peters & Herron Dash Co., Gift St., Columbus, O. "Invincible."

Premier Auto Novelty Mfg. Co., 375 W. Broadway, New York, N. Y.

Racine Top, Dash & Cushion Co., 1214 14th St., Racine, Wis.

Warner Auto Top Co., 1622-26 Central Ave., Cincinnati, O.

Western Auto Top Co., 1208-10 Jackson St., Omaha, Neb.

Wilcox Co., M. I., Water St., Toledo, O.

Wisconsin Auto Top Co., 1701 Hamilton Ave., Racine, Wis. "Badger." (See page 227.)

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COVERS, Spare Tire

(For covering spare tires and tubes; also for demountable rims or wheels)

Allen Auto Specialty Co., 16 W. 61st St., New York, N. Y. (See page 229.)

Atlas Specialty Mfg. Co., 16-22 E. 24th St., Chicago, Ill. "Howard," "Chicago." (See page 123.)

B. E. Mfg. Co., 18-22 W. 18th St., New York, N. Y. (See page 223.)

Bailey Co., R. B., 1316 S. Grand Ave., Los Angeles, Cal. "Fitwell."

Central Auto Top Co., 421-25 N. Capitol Ave., Indianapolis, Ind.

Chicago—See Atlas Specialty Mfg. Co.

Chicago Wholesale Saddlery & Mfg. Co., 125-27 N. Halsted St., Chicago, Ill.

Dafoe-Eustice Co., 1164-72 W. Jefferson Ave., Detroit, Mich. "Duk-Bak," "Deco." (See page 227.)

Deco—See Dafoe-Eustice Co.

Duk-Bak—See Dafoe-Eustice Co.

Easy-On—See Gordon Co.

Ero Mfg. Co., 700 W. 22d St., Chicago, Ill.

Fitwell—See Bailey Co.

Fitzwell—See Niagara Fabric Mfg. Co.

Gilbert Mfg. Co., 70-80 Center St., New Haven, Conn.

Gordon Co., J. F., 303 N. Fourth St., Columbus, O. "Easy-On." (See page 225.)

Goss Co., J. C., 16 Woodbridge St., E. Detroit, Mich.

H. B.—See Hopewell Bros.

Holden Mfg. Co., 409 N. Franklin Ave., St. Paul, Minn. "Northwest."

Hopewell Bros., Watertown, Mass. "Russell," "H. B." (See page 229.)

Howard—See Atlas Specialty Mfg. Co.

Imperial—See Winship, W. W.

Invincible—See Peters & Herron Dash Co.

Keystone—See Nathan Novelty Mfg. Co.

Landers Bros. Co., Blucher & Buckingham Sts., Toledo, O.

Martin Mfg. Co., Forest Rose Ave., Lancaster, O.

Nathan Novelty Mfg. Co., 84-90 Reade St., New York, N. Y. "Keystone," "Presto." (See page 153.)

Niagara Fabric Mfg. Co., 47 Greene St., New York, N. Y. "Fitzwell."

Northwest—See Holden Mfg. Co.

Peters & Herron Dash Co., Gift St., Columbus, O. "Invincible."

Premier Auto Novelty Mfg. Co., 375 W. Broadway, New York, N. Y.

Presto—See Nathan Novelty Mfg. Co.

Russell—See Hopewell Bros.

Sala Co., Canton, O.

Springfield Harness Co., 55-61 Dwight St., Springfield, Mass.

Taylor Trunk Works, C. A., 678 N. Halsted St., Chicago, Ill.

Winship, W. W., 71 Summer St., Boston, Mass. "Imperial."

COVERS, Spare Tire, for Fords

(For covering spare tires and tubes; also for demountable rims or wheels)

Allen Auto Specialty Co., 16 W. 61st St., New York, N. Y. (See page 229.)

Atlas Specialty Mfg. Co., 16-20 E. 24th St., Chicago, Ill. "Ezy," "Howard." (See page 123.)

B. E. Mfg. Co., 18-22 W. 18th St., New York, N. Y. (See page 223.)

Copp Co., George W., 351-55 W. 52d St., New York, N. Y. (See page 227.)

Easy-On—See Gordon Co.

Ezy—See Atlas Specialty Mfg. Co.

Gordon Co., J. P., 303 N. Fourth St., Columbus, O. "Easy-On." (See page 225.)

Holden Mfg. Co., 409 N. Franklin Ave., St. Paul, Minn.

Hopewell Bros., Watertown, Mass. (See page 229.)

Howard—See Atlas Specialty Mfg. Co.

Invincible—See Peters & Herron Dash Co.

Nathan Novelty Mfg. Co., 84-90 Reade St., New York, N. Y. (See page 153.)

Peters & Herron Dash Co., Gift St., Columbus, O. "Invincible."

COVERS, SPRING—See Cups, Spring Leaf Lubricating

COVERS, STARTING CRANK—See Holders, Starting Crank

COVERS, STEERING KNUCKLE—See Boots, Steering Knuckle

COVERS or Grips, Steering Wheel

(Leather, Rubber or Fabric Covers to lace or button on steering wheel rim to improve the grip)

Atlas Specialty Mfg. Co., 16-22 E. 24th St., Chicago, Ill. (See page 123.)

B. E. Mfg. Co., 18-22 W. 18th St., New York, N. Y. (See page 223.)

Empire Rubber & Tire Co., Mulberry St. & Clinton Ave., Trenton, N. J.

Eze-Grip—See Hayne-Surridge Auto Goods Co.

Hayne-Surridge Auto Goods Co., 1017 Lucas Ave., St. Louis, Mo. "Eze-Grip."

Hoover Co., W. H., New Berlin, O.

Nathan Novelty Mfg. Co., 84-90 Reade St., New York, N. Y. (See page 153.)

Niagara Fabric Mfg. Co., 47 Greene St., New York, N. Y.

Parker-Stearns & Co., 286 Sheffield Ave., Brooklyn, N. Y.

COVERS, TIRE—See Covers, Spare Tire

COVERS, Top

(See also Tops, Automobile)

Atlas Specialty Mfg. Co., 16-22 E. 24th St., Chicago, Ill. (See page 123.)

B. E. Mfg. Co., 18-22 W. 18th St., New York, N. Y. (See page 223.)

Bush & Scheu, 500-10 Webster Ave., Cincinnati, O. (See page 711.)

Central Auto Top Co., 421-25 N. Capitol Blvd., Indianapolis, Ind.

Chicago Wholesale Saddlery & Mfg. Co., 125-27 N. Halsted St., Chicago, Ill.

Co-Zee—See Omaha Auto Top Co.

Detroit Slip Cover Co., 22 Hendrie Ave., Detroit, Mich. "Pro-Tec-Shun."

Ero Mfg. Co., 700 W. 22d St., Chicago, Ill.

Geco—See Glover Equipment Co.

Glover Equipment Co., 412 N. Capitol Ave., Indianapolis, Ind. "Geco."

London Auto Supply Co., 2548 Wabash Ave., Chicago, Ill.

Myar Mfg. Co., 124 E. Fourth St., Little Rock, Ark.

Nathan Novelty Mfg. Co., 84-90 Reade St., New York, N. Y. (See page 153.)

Niagara Fabric Mfg. Co., 47 Greene St., New York, N. Y.

Omaha Auto Top Co., 709-11 S. 15th St., Omaha, Neb. "Co-Zee."

Pro-Tec-Shun—See Detroit Slip Cover Co.

Springfield Auto Top & Upholstery Co., 226 Chestnut St., Springfield, Mass.

Vehicle Top & Supply Co., 3414 Lindell Ave., St. Louis, Mo. "Vesco."

Vesco—See Vehicle Top & Supply Co.

Warner Auto Top Co., 1622-26 Central Ave., Cincinnati, O.

Wheel Top & Hardware Co., 127 E. Eighth St., Cincinnati, O.

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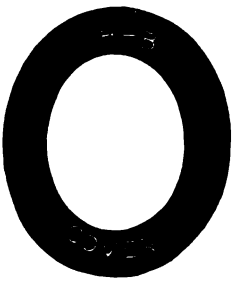

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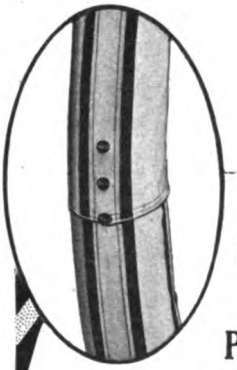

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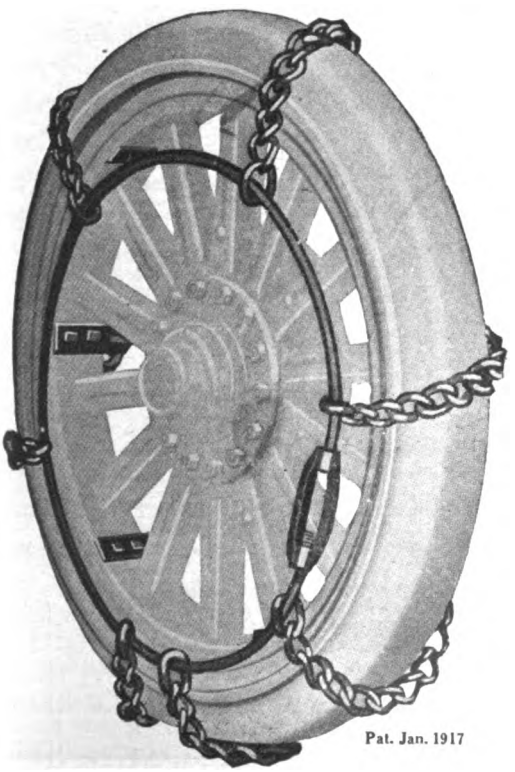

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COVERS, Top, for Fords

(See also Tops, Automobile)

Atlas Specialty Mfg. Co., 16-22 E. 24th St., Chicago, Ill. (See page 123.)

Buob & Scheu, 500-10 Webster Ave., Cincinnati, O. (See page 711.)

Donlin Auto Co., C. A., Hopkins, Mo.

Easy-On—See Gordon Co.

Gates Mfg. Co., 835 N. Meridian Ave., Indianapolis, Ind.

Gordon Co., J. P., 303 N. Fourth St., Columbus, O. "Easy-On." (See page 225.)

London Auto Supply Co., 2548 Wabash Ave., Chicago, Ill.

Nathan Novelty Mfg. Co., 84-90 Reade St., New York, N. Y. (See page 153.)

Niagara Fabric Mfg. Co., 47 Green St., New York, N. Y.

Premier Auto Novelty Mfg. Co., 375 W. Broadway, New York, N. Y.

Racine Top, Dash & Cushion Co., 1214 14th St., Racine, Wis.

Roberts Co., C. F., 278 Brush St., Detroit, Mich.

Warner Auto Top Co., 1622-26 Central Ave., Cincinnati, O.

COVERS, UNIVERSAL JOINT—See Boots, Steering Knuckle

COVERS, UPHOLSTERY—See Covers, Slip

COVERS, WHEEL—See Covers, Steering Wheel

COVERS or SHIELDS, Automatic Radiator

(Metal Cover or Shield automatically opened or closed by a thermostat—See also Regulators, Water)

Detroit Motor Appliance Co., Detroit, Mich. (See page 231.)

Pines Mfg. Co., 56 E. Randolph St., Chicago, Ill.

COWL BOARDS FOR FORDS—See Cowls, Dash

COWLS, Dash and Cowl Boards, for Fords

Buob & Scheu, 500-10 Webster Ave., Cincinnati, O. (See page 711.)

Edelmann & Co., E., 341-63 E. Ohio St., Chicago, Ill.

Johns-Manville Co., H. W., Madison Ave. & 41st St., New York, N. Y. (Sole Distributor for Jones Speedometer Co., Brooklyn, N. Y.)

Jones Speedometer Co.—See Johns-Manville Co.

Malco—See Malton Specialty Co.

Malton Specialty Co., 755 Boylston St., Boston, Mass. "Malco."

Motor Products Corporation, Detroit, Mich. (See page 231.)

Stewart-Warner Speedometer Corp., Chicago, Ill. (See page 499.)

Van Sicklen Co., Elgin, Ill. (See page 627.)

Warnerite Co., 518 Harrison St., Davenport, Ia.

Whetstone & Co., John H., Lapeer, Mich.

CRADLES, Radiator, for Fords

(Stamped steel plate or support to carry weight of radiator and prevent side lugs from being damaged)

Gahm & McCormick Co., 802 E. Main St., Streator, Ill.

H & M—See Radius Rod Co.

Martens Co., E. A., Ninth & Main Sts., Lafayette, Ind.

Mazura Mfg. Co., 414 S. Sixth St., St. Louis, Mo.

Radius Rod Co., Lamoni, Ia. "H & M."

CRANES, HOISTS and CHAIN BLOCKS, Portable

Acme—See Moore Co.

Alben Co., 27th Ave. & Wahl St., Milwaukee, Wis.

Boston & Lockport Block Co., 134 Condor St. (E. Boston), Boston, Mass.

Brown Hoisting Machinery Co., 4403 St. Clair Ave., Cleveland, O. "Brownhoist."

Brownhoist—See Brown Hoisting Machinery Co.

Cameron Engineering Co., Washington, N. J

Canton Foundry & Machine Co., Third St. & Savannah Ave., S. E., Canton, O.

Chisholm-Moore Mfg. Co., Cleveland, O. "Cyclone."

Cleveland Chain & Mfg. Co., Cleveland, O.

Craig Engineering Co., 1011 Sante Fe Ave., Los Angeles, Cal.

Cyclone—See Chisholm-Moore Mfg. Co.

Ford Chain Block & Mfg. Co., 139 W. Oxford St., Philadelphia, Pa. "Tribloc."

Franklin Portable Crane & Hoist Co., Franklin, Pa.

Harrington Son & Co., Edwin, 17th & Callowhill Sts., Philadelphia, Pa. "Peerless."

Imperial—See Ingersoll-Rand Co.

Imperial—See Moore Co.

Ingersoll-Rand Co., 11 Broadway, New York, N. Y. "Imperial."

Keystone Garage Equipment Co., 201 Devonshire St., Boston, Mass.

Klemme Mfg. Co., A. C., Davenport, Iowa. (See page 785.)

Lane Bros. Co., 48 Prospect St., Poughkeepsie, N. Y.

McGregor—See U. S. Auto Bumper Co.

Manley Hilite—See United Engine & Mfg. Co

Miller—See Portable Tool Supply Co.

Milton & Son, S. G., Franklin, Pa.

Moore Co., Franklin, Winsted, Conn. "Acme." "Imperial."

New Jersey Foundry & Machine Co., 90 West St., New York, N. Y.

Niles-Bement-Pond Co., 111 Broadway, New York, N. Y.

Peerless—See Harrington, Son & Co.

Portable Tool Supply Co., Buffalo, N. Y. "Miller." (See page 231.)

Richards-Wilcox Mfg. Co., Third St. & C., B. & Q. R. R. tracks, Aurora, Ill.

Round & Son, D., 7625 Broadway, Cleveland, O. "Simplex," "Weston," "Superior."

Simplex—See Round & Son.

Speidel, J. G., Reading, Pa. (See page 271.)

Superior—See Round & Son.

Toepper's Sons, Frank, 460 National Ave., Milwaukee, Wis.

Tribloc—See Ford Chain Block & Mfg. Co.

U. S. Auto Bumper Co., 115 E. 30th St., Chicago, Ill. "McGregor."

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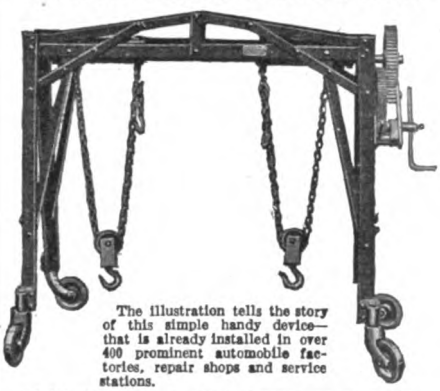

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Union Elevator & Machine Co., 227 W. Erie St., Chicago, Ill. "Weston."

United Engine & Mfg. Co., Hanover, Pa. "Manley Hilite." (See page 239.)

Weaver Mfg. Co., 2173 S. Ninth St., Springfield, Ill.

Weston—See Round & Son.

Weston—See Union Elevator & Machine Co.

Whitney Mfg. Co., R. S., Lewiston, Me.

Wright Mfg. Co., Lisbon, O.

Yale & Towne Mfg. Co., 9 E. 40th St., New York, N. Y. (See page 419.)

CRANK CASE BOLTS FOR FORDS—See Bolts, Engine

CRANK CASE BREATHERS FOR FORDS—See Breathers, Crank Case

CRANK CASE REPAIR ARMS FOR FORDS—See Arms, Crank Case Repair

CRANK HANDLES—See Handles, Starting Crank

CRANK HOLDERS—See Holders, Starting Crank

CRANK LOCKS FOR FORDS—See Locks, Starting Crank

CRANK PIN GRINDERS — See Grinders, Crank Pin

CRANK PIN LATHES—See Lathes, Crank Pin

CRANKS, Safety Starting

(To prevent bodily injury from back kicks)

Oulton Mfg. Co., 311 Atlantic Ave., Boston, Mass.

CRANKS, Safety Starting, for Fords

(To prevent bodily injury from back kicks)

Bear—See Robinson, E.

Bear Mfg. Co., E. 17th St. & First Ave., Rock Island, Ill.

Carson Mfg. Co., Mutual Bldg., Richmond, Va.

Ketch-a-Kick—See Palmer Auto Parts Co.

Palmer Auto Parts Co., Wooster, O. "Ketch-a-Kick."

Robinson, E., 2674 Atlantic Ave., Brooklyn, N. Y. "Bear."

Sprague Mfg. Co., E. H., 18th & Izard Sts., Omaha, Neb.

Thompson Mfg. Co., 311 24th St., Des Moines, Ia.

CRANKSHAFT BUSHINGS FOR FORDS—See Bushings, Bronze

CRANKSHAFT COUNTERBALANCES FOR FORDS — See Counterbalances, Crankshaft

CRANKSHAFT GRINDING TOOLS—See Tools, Crankshaft Grinding

CRANKSHAFTS, Finished or Machined

(For Crankshafts in the rough—See Forgings, Drop)

Allison & Co., Chester, Pa. (See page 597.)

Anderson Forge & Machine Co., Detroit, Mich. (See page 291.)

Atlas Mfg. Co., Fostoria, O. (See page 233.)

Automobile Crankshaft Corp., Detroit, Mich. (See page 399.)

Gill & Sons Forge & Machine Works, P. H., Lorraine & Otsego Sts., Brooklyn, N. Y. (See page 239.)

Jackson Motor Shaft Co., Jackson, Mich. (See page 141.)

Ladish Drop Forge Co., Cudahy, Wis. (See page 333.)

Leland-Gifford Co., 1025 Southbridge St., Worcester, Mass.

Michigan Crankshaft Co., River & Lenawee Sts., Lansing, Mich.

Moltrup Steel Products Co., Beaver Falls, Pa.

National Engineering Co., Saginaw, Mich. (See page 459.)

Park Drop Forge Co., Cleveland, O. (See page 235.)

Savage Arms Corp., Sharon, Pa. (See page 213.)

Standard Gauge Steel Co., Beaver Falls, Pa. (See page 341.)

Sundberg Co., Kinzie & Carpenter Sts., Chicago, Ill.

Tindell-Morris Co., Eddystone, Pa.

Union Drop Forge Co., 358 W. Indiana St., Chicago, Ill.

CREEPERS OR REPAIR TRUCKS—See Trucks, Repair

CRIMPING MACHINES — See Machines, Crimping

CROWN FENDERS FOR FORDS—See Guards, Mud

CRUCIBLES, Metal Melting

Bartley Crucible Co., Jonathan, Oxford St., Trenton, N. J.

Bay State Crucible Co., Taunton, Mass.

Dixon Crucible Co., Joseph, Jersey City, N. J. (See page 439.)

Gautier & Co., J. H., Green & Essex Sts., Jersey City, N. J.

McCullough-Dalzell Crucible Co., Pittsburgh, Pa.

Ross-Tacony Crucible Co. (Tacony), Philadelphia, Pa.

Seidel, R. B., 1322-24 Callowhill St., Philadelphia, Pa.

Taunton Crucible Co., Taunton, Mass.

CUFF PROTECTORS—See Protectors, Sleeve

CUP CYLINDER LUBRICATORS — See Lubricators, Cup Cylinder

CUP GREASES—See Greases, Cup

CUP WRENCHES—See Wrenches, Grease Cup

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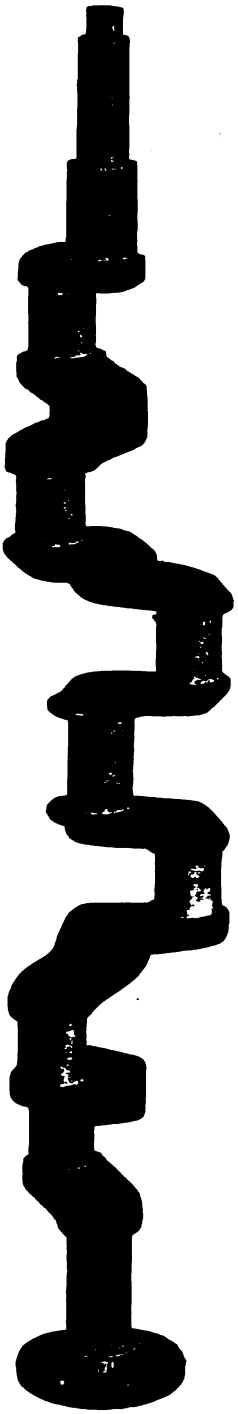

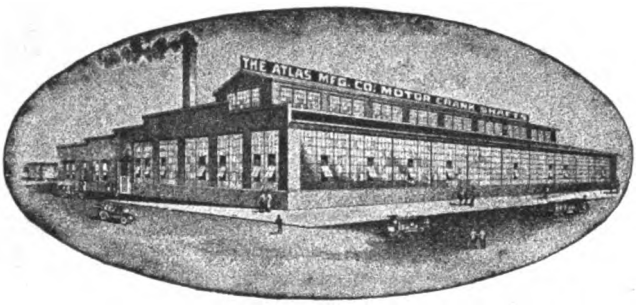

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CUPS and Cones, Ball

(See also Machine Work; also Screw Machine Products)

Ashley Machine Works, 724 University Ave., Rochester, N. Y.
Auburn Ball Bearing Co., 27 Elizabeth St., Rochester, N. Y. (See page 87.)
Bossert Corp., Utica, N. Y. (See page 363.)
Buffalo Pressed Steel Co., Buffalo, N. Y. (See page 473.)
Crosby Co., Buffalo, N. Y. (See page 669.)
Hartford Machine Screw Co., Hartford, Conn. (See page 513.)
Michigan Screw Co., Lansing, Mich.
Peninsular Milled Screw Co., 1090 Lafayette St., E. Detroit, Mich.
Reese Machine & Tool Works, S., 224-30 W. Main St., Plymouth, Pa.
U. S. Automatic Co., Amherst, O.
Western Automatic Machine Screw Co., Elyria, O.
Worcester Pressed Steel Co., Worcester, Mass.

CUPS, CYLINDER LUBRICATING — See Lubricators, Cup Cylinder

CUPS, GREASE—See Cups, Oil and Grease

CUPS, Oil and Grease

Active—See Sherman Mfg. Co.
Agner Simplex Co.—See Hinrichs Mfg. Co.
Airspring—See Hunter Pressed Steel Co.
Ajax—See City Iron Works & Machine Co.
Albany Lubricating Co., 708-10 Washington St., New York, N. Y. (Grease Cups only.)
American Brass Novelty Co., Grand Haven, Mich.
American Injector Co., 175 14th Ave., Detroit, Mich.
American Lubricator Co., 201 Summit Ave., Detroit, Mich.
American Stamping Co., Battle Creek, Mich.
Arrow—See Long Bros.
Atlas—See Lunkenheimer Co.
Bailey Co., W. J., Newark, N. J. "Climax."
Bassick Co., 38 Austin St., Bridgeport, Conn.
Bay State Stamping Co., 380 Chandler St., Worcester, Mass.
Bear—See Powell Co.
Besly & Co., Charles H., 118-24 N. Clinton St., Chicago, Ill. "Helmet."
Bowen Products Corp., Auburn Division, Auburn, N. Y. "Empress." (See page 237.)
Bowen Products Corp., 866 Warren Ave., W., Detroit, Mich. (See page 121.)
Bridgeport—See Hamilton & De Loss.
Bruno—See Powell Co.
Buckeye Iron & Brass Works, 324 E. Third St., Dayton, O.
Camden—See Lindholm Metal Stamping Co.
Cardinol—See Lunkenheimer Co.
Chicago—See Ohio Injector Co.
City Iron Works & Machine Co., 520 S. Delaware Ave., Philadelphia, Pa. "Ajax," "Larg-Hex."
Climax—See Bailey Co.
Coin—See Powell Co.
Colonial—See Powell Co.
Consort—See Powell Co.
Copeman Laboratories, Saginaw St., Flint, Mich.
Crane Co., 836 S. Michigan Ave., Chicago, Ill.
Cutter—See Long Bros.
Dawson Mfg. Co., 4900 Broadway, Chicago, Ill.
Detroit Lubricator Co., Trumbull & Grand Trunk R. R., Detroit, Mich.
Edelmann & Co., E., 341-63 E. Ohio St., Chicago, Ill.
Empress—See Bowen Products Corp.
Essex Brass Co., G. B., 480-86 Franklin St., Detroit, Mich.
Exeter Brass Works, Exeter, N. H.
Gem—See Lunkenheimer Co.
Gits Bros. Mfg. Co., 1940 Kilbourne Ave., Chicago, Ill.
Greer, Frederic, 525 W. Van Buren St., Chicago, Ill.
Greist Mfg. Co., New Haven, Conn. "Noreca." (See page 255.)
Guardian—See Sherman Mfg. Co.
Hamilton & De Loss, Bridgeport, Conn. "Bridgeport."
Helmet—See Besly & Co.
Hinrichs Mfg. Co., 115 S. Dearborn St., Chicago, Ill. (Sole Distributors for Agner Simplex Co., Burlington, Wis.)
Hunter Pressed Steel Co., Orthodox & Horrocks Sts., Philadelphia, Pa. "Airspring."
Ideal—See Lunkenheimer Co.
Imperial Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill. (See page 733.)
Jewel—See Lunkenheimer Co.
Kelly & Jones Co., Greensburg, Pa.
Larg-Hex—See City Iron Works & Machine Co.
Lindholm Metal Stamping Co., 107-15 Erie St., Camden, N. J. "Vale," "Camden," "Madeira," "McKee," "Simplex," "Reno." (See page 351.)
Lion—See Lunkenheimer Co.
Long Bros., Broadway & Buckeye St., Kokomo, Ind. "Arrow," "Cutter."
Lubrik—See Warnola Mfg. Co.
Lunkenheimer Co., Beekman & Waverly Sts., Cincinnati, O. "Ideal," "Lion," "Pioneer," "Royal," "Sentinel," "Tiger," "Gem," "Cardinel," "Mite," "Majestic," "Jewel," "Owl," "Atlas," "Reliance," "Primo," "Wingo," "Securo," "Surety."
M & E—See Merchant & Evans Co.
McKee—See Lindholm Metal Stamping Co.
McRae & Roberts Co., 221-35 Campbell Ave., Detroit, Mich.
Mac—See Powell Co.
Madeira—See Lindholm Metal Stamping Co.
Madison Kipp Lubricator Co., 2227 Waukesha St., Madison, Wis.
Majestic—See Lunkenheimer Co.
Mascot—See Powell Co.
Mecca—See Powell Co.
Merchant & Evans Co., Philadelphia, Pa. "M. & E." (See page 377.)
Michigan Lubricator Co., Detroit, Mich. (See page 195.)
Mikado—See Powell Co.
Milwaukee Valve Co., 139 Burrell St., Milwaukee, Wis.
Mite—See Lunkenheimer Co.
Mogul—See Powell Co.
Monitor Lubricating Co., 1218 Chestnut St., Philadelphia, Pa.
National Brass Mfg. Co., 191-93 Mill St., Rochester, N. Y.
Noreca—See Greist Mfg. Co.
Ohio Injector Co., Wadsworth, O. "Chicago."
Owl—See Lunkenheimer Co.
Penberthy Injector Co., Detroit, Mich. "Sterling."
Penn Pressed Metal Co., Newton Ave. & Line St., Camden, N. J.
Perfect—See Sherman Mfg. Co.
Pioneer—See Lunkenheimer Co.

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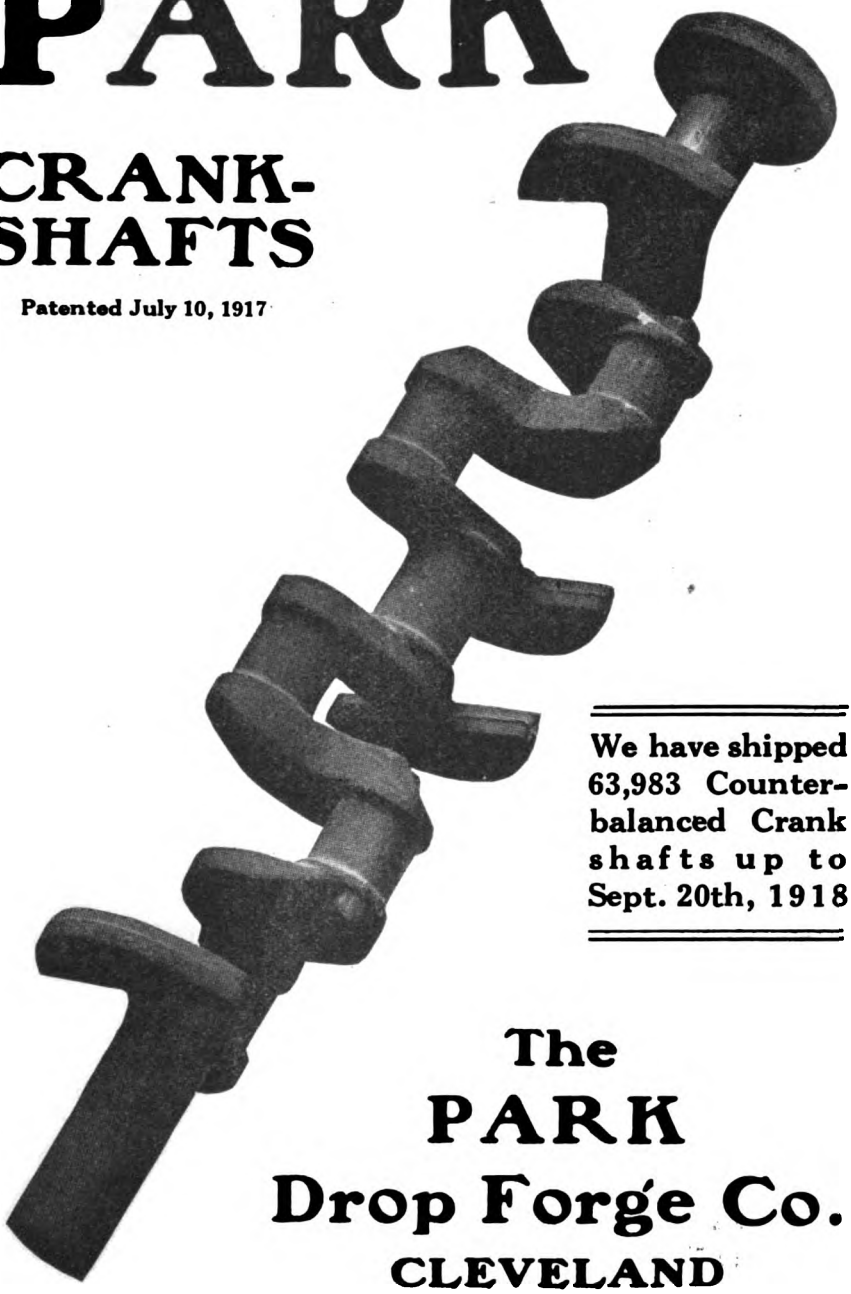
COUNTERBALANCED PARK CRANK-SHAFTS

Patented July 10, 1917



We have shipped 63,983 Counter-balanced Crank shafts up to Sept. 20th, 1918

The PARK Drop Forge Co.
CLEVELAND

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CUPS, Oil and Grease (Continued)

Powell Co., Wm., 2525 Spring Grove Ave., Cincinnati, O. "Mogul," "Progress," "Renown," "Vanguard," "Colonial," "Mecca," "Consort," "Mac," "Bruno," "Bear," "Coin," "Mascot," "Mikado." (See page 195.)

Premium—See Sherman Mfg. Co.

Primo—See Lunkenheimer Co.

Progress—See Powell Co.

Reliance—See Lunkenheimer Co.

Reno—See Lindholm Metal Stamping Co.

Renown—See Powell Co.

Rich Mfg. Co., 370 Atlantic Ave., Boston, Mass.

Royal—See Lunkenheimer Co.

Securo—See Lunkenheimer Co.

Sentinel—See Lunkenheimer Co.

Sherman Mfg. Co., H. B., 12 Barney St., Battle Creek, Mich. "Premium," "Perfect," "Guardian," "Active."

Simplex—See Lindholm Metal Stamping Co.

Stahl Mfg. Co., 983 17th Ave., S. E., Minneapolis, Minn.

Star Brass Mfg. Co., 108-14 E. Dedham St., Boston, Mass.

Star Brass Works, 2623 McGee Ave., Kansas City, Mo.

Sterling—See Penberthy Injector Co.

Surety—See Lunkenheimer Co.

Tiger—See Lunkenheimer Co.

Tucker, W. H. & C. F., Hartford, Conn. (See page 223.)

Vale—See Lindholm Metal Stamping Co.

Vanguard—See Powell Co.

Warnola Mfg. Co., 73 Wooster St., New York, N. Y. "Lubrik."

Wilkinson Co., Wm. H., West Medway, Mass.

Williams Valve Co., D. T., Spring Grove Ave. & Township St., Cincinnati, O.

Wingo—See Lunkenheimer Co.

CUPS, Oil and Grease, for Fords

Bowen Products Corp., Auburn Division, Auburn, N. Y. "Empress." (See page 237.)

Edelmann & Co., E., 341-63 E. Ohio St., Chicago, Ill.

Empress—See Bowen Products Corp.

Evergood—See Grossman Mfg. Corp.

Freeman Brass Works, 92 Bowery, New York, N. Y.

Grossman Mfg. Corp., Emil, Bush Terminal Bldg. No. 20, Brooklyn, N. Y. "Evergood."

Hill-Smith Metal Goods Co., Dept. H., Boston, Mass. (See page 221.)

Metal Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

Nelson Mfg. Co., A., 2700 Southport Ave., Chicago, Ill.

Tucker, W. H. & C. F., Hartford, Conn. (See page 223.)

Whitehouse-LeCompte Mfg. Co., 42-54 Elm St., Newark, N. J.

CUPS, ORDINARY PRIMING—See Cocks, Standard Pet

CUPS, Spring Key Priming

(For ordinary priming cups—See Cocks, Standard Pet)

Amalgamated Brass Co., Blanchester, O.

American Brass & Iron Co., Detroit, Mich. (See page 153.)

American Injector Co., 175 14th Ave., Detroit, Mich.

American Lubricator Co., 201 Summit Ave., Detroit, Mich.

Becco—See Michigan Motor Specialties Co.

Britton—See Frasse & Co.

Commonwealth Brass Corp., Commonwealth Ave. & Grand Trunk Ry., Detroit, Mich.

Crum-Wiley Mfg. Co., Peru, Ind.

Detroit Valve and Fittings and Detroit Brass Works, 99 Hobart St., Detroit, Mich.

Edelmann & Co., E., 341-63 E. Ohio St., Chicago, Ill.

Frasse & Co., Peter A., 417 Canal St., New York, N. Y. "Britton." (See page 657.)

Hancock Mfg. Co., 770 Henry St., Charlotte, Mich.

Hepburn—See Victor Brass Mfg. Co.

Imperial Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill. (See page 733.)

Kant-Klog—See Taylor Machine Co.

King, W. C., 911 Sargent St., Litchfield, Ill.

Lincoln Brass Works, Detroit, Mich. (See page 193.)

Lunkenheimer Co., Beekman & Waverly Sts., Cincinnati, O.

McRae & Roberts Co., 211-35 Campbell Ave., Detroit, Mich.

Michigan Lubricator Co., Detroit, Mich. (See page 195.)

Michigan Motor Specialties Co., 26-40 Dubois St., Detroit, Mich. "Becco."

National Brass Mfg. Co., 191-93 Mill St., Rochester, N. Y.

Penberthy Injector Co., Detroit, Mich.

Powell Co., Wm., 2525 Spring Grove Ave., Cincinnati, O. (See page 195.)

Roberts Brass Mfg. Co., 1395-1407 Fort St., W., Detroit, Mich.

South Park Mfg. Co., Port Huron, Mich.

Standard Brass Works, 97-109 Wight St., Detroit, Mich.

Sterling & Skinner Mfg. Co., Russell St. & E. Grand Blvd., Detroit, Mich.

Taylor Machine Co., 7804 Carnegie Ave., Cleveland, O. "Kant-Klog."

Victor Brass Mfg. Co., 6813 Wade Park Ave., Cleveland, O. "Hepburn."

CUPS and Covers, Spring Leaf Lubricating

(Oil cups or boxes, felt oilers or lubricant retaining covers to be applied to springs to keep them lubricated and so eliminate squeaks; for Spring Lubricating Strips—See Strips, Spring Leaf Lubricating; for Spring Leaf Separating Tools—See Tools, Spring Leaf Separating.)

Babbitt Spring Oiler Co., 1907 E. 13th St., Cleveland, O.

Bailey Co., W. J., Newark, N. J.

Brown Spring Oiler Co., 6911 Euclid Ave., Cleveland, O.

G. L. W. Spring Oiler Co.—See Hudson Sales Co.

Grus Leaf-Spring Oiler Co., Chicago, Ill.

Hastings Mfg. Co., Hastings, Mich.

Hudson Sales Co., 7 E. Jackson Blvd., Chicago, Ill. (Sole Distributors for G. J. W. Spring Oiler Co., San Diego, Cal).

Improved Gauge Mfg. Co., 105 Canal St., Syracuse, N. Y. (See page 323.)

Jeavons, A. N., 806 Champlain Ave., Cleveland, O.

Lazarus Mfg. Co., 750-800 Prospect Ave., Cleveland, O. "Lasco."

Lasco—See Lazarus Mfg. Co.

Leader Tire Shop, 3049 W. 25th St., Cleveland, O.

Sterling Mfg. Co., Blackstone Bldg., Cleveland, O.

Van Spring Oiler Co., 222 N. Wabash Ave., Chicago, Ill.

Woodworth Mfg. Corp., Niagara Falls, N. Y. (See page 721.)

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EMPRESS

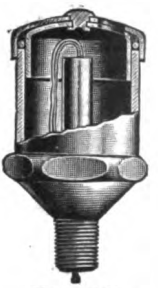
OIL AND GREASE CUPS

No. 222

Spring Compression Fig. 215

Invisible Ratchet Fig. 233

Marine Fig. 213


No. 5739

Short Pat. Marine Fig. 220

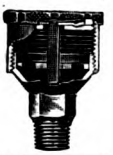
Grease Bolt Fig. 112

Grease Bolt Fig. 111

Oil Bolt Fig. 113

DeLuxe Fig. 232

Plain Fig. 200


Spring Lock Fig. 203

Wire Lock Fig. 205

Ratchet Fig. 209

Wing Top Ratchet Fig. 210

Leather Packed Fig. 207

Outside Lock Fig. 224

Style "K" Fig. 54

Style "N" Fig. 53

Style "D" Fig. 52

Style "B" Fig. 51

Style "A" Fig. 50

Style "L" Fig. 55

Style "C" Fig. 56

BOWEN PRODUCTS CORPORATION

AUBURN DIVISION

Successor to

Bowen Manufacturing Company

Auburn, N. Y.

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CUPS and Covers, Spring Leaf Lubricating, for Fords

(Oil cups or boxes, felt oilers or lubricant retaining covers to be applied to springs to keep them lubricated and so eliminate squeaks)

Bowen Products Corp., Auburn Division, Auburn, N. Y. (See page 237.)

Brown Spring Oiler Co., 6911 Euclid Ave., Cleveland, O.

Grus Leaf-Spring Oiler Co., Chicago, Ill.

Jeavons, A. N., 806 Champlain Ave., Cleveland, O.

Waters Bros. Co., 6543 Greenview Ave., Chicago, Ill.

CURB BOXES—See Boxes, Hose

CURING BAGS—See Bags, Steam Tire Curing

CURLED HAIR—See Hair, Upholstery

CURRENT RECTIFIERS—See Rectifiers, Alternating Current

CURTAIN CASES FOR FORDS—See Cases, Curtain

CURTAIN CLIPS—See Clips, Curtain

CURTAIN FASTENERS—See Fasteners, Curtain

CURTAIN LIGHTS—See Lights, Curtain; also Windows, Glass Curtain

CURTAIN OPENERS—See Openers, Curtain

CURTAIN OPENING FITTINGS—See Openers, Curtain

CURTAIN ROLLERS—See Rollers, Curtain

CURTAIN WINDOWS—See Windows, Glass Curtain

CURTAINS, Special Top

(For ordinary curtains—See Tops, Automobile)

Collins—See Novelty Leather Works.

Jiffy Auto Curtain Co., Dodge Power Bldg., Detroit, Mich.

Novelty Leather Works, Jackson, Mich "Collins."

Standard Auto Top & Body Co., 1333 Race St., Philadelphia, Pa.

CURTAINS, Special Top, for Fords

(For ordinary curtains—See Tops, Special)

Copp Co., George W., 351-55 W. 52d St., New York, N. Y. (See page 227.)

CUSHIONS, BACK REST—See Rests, Cushion

CUSHIONS, Special Seat

(For ordinary cushions—See Bodies; also Tops)

Busse & Co., W. A., 2702 W. Lake St., Chicago, Ill.

Perfection—See Pneumatic Mfg. Co.

Pneumatic Mfg. Co., 526 17th St., Brooklyn, N. Y. "Perfection."

CUT-OUT PEDALS—See Pedals, Horn

CUT-OUT SWITCHES—See Switches, Automatic Cut-out

CUT-OUTS, Automatic Ignition, for Fords

(For automatically breaking the ignition circuit when motor stops with switch on)

Ewing & Ewing, Dept. B., Jeromeville, O. (See page 613.)

CUT-OUTS, MUFFLER—See Valves, Muffler Cut-Out; also Pedals, Horn and Cut-Out

CUTTER GRINDERS—See Grinders, Reamer

CUTTERS, BAR—See Cutters, Rod and Bar

CUTTERS, Brake Lining

Peck, Stow & Wilcox Co., Southington, Conn. "Pexto."

Pexto—See Peck, Stow & Wilcox Co.

CUTTERS, Circular Glass

(For cutting lamp or instrument glasses)

Red Devil—See Smith & Hemenway.

Millers Falls Co., Millers Falls, Mass.

Smith & Hemenway, 130 Coit St., Irvington, N. J. "Red Devil."

CUTTERS, GASKET—See Cutters, Washer and Gasket

CUTTERS, GLASS—See Cutters, Circular Glass

CUTTERS, LINING — See Cutters, Brake Lining

CUTTERS, Milling

Advance Machinery Co., Van Wert, O.

Barber-Colman Co., Rockford, Ill.

Brown & Sharpe Mfg. Co., Promenade St., Providence, R. I.

Cleveland Twist Drill Co., E. 49th St. & Lakeside Ave., Cleveland, O.

Clough, R. M., Tolland, Conn.

Detroit Twist Drill Co., Detroit, Mich. (See page 259.)

Illinois Tool Works, Chicago, Ill.

Ingersoll Milling Machine Co., Rockford, Ill.

Lincoln-Williams Twist Drill Co., Taunton, Mass.

Morse Twist Drill & Machine Co., New Bedford, Mass.

National Tool Co., W. 112th St. & Madison Ave., Cleveland, O.

National Twist Drill & Tool Co., Brush St. nr. Grand Blvd., Detroit, Mich.

Parker Machine Co., 221 High St., Boston, Mass.

Perelstrous & Storms Tool Corp., 42 Broadway, New York, N. Y. (See page 643.)

Pratt & Whitney Co., 111 Broadway, New York, N. Y. (See page 73.)

Reliance Steel & Tool Co., 24-26 Murray St., New York, N. Y. (Dealers.) (See page 275.)

Screw Machine Products Corp., 1012 Eddy St., Providence, R. I.

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The Greater Lift *and* Overhang *of the*

MANLEY PORTABLE CRANE

make it the most efficient crane for automobile work. In addition, it is counterbalanced, the superstructure being of light steel and the base of heavy cast iron. It is the only crane with this feature. Made in 1, 1½ and 2 ton capacities; lifts from 6'6" to 9'6".

Sold also without hoist mechanism for use with chain block. Write for prices.

The Manley Engine Stand

Saves Mechanic's Time

and increases his efficiency. He can turn the engine in any position desired, and thus get at it from any angle. Mounts any type of motor, including three point suspension. Universal adjustments. Write for prices.

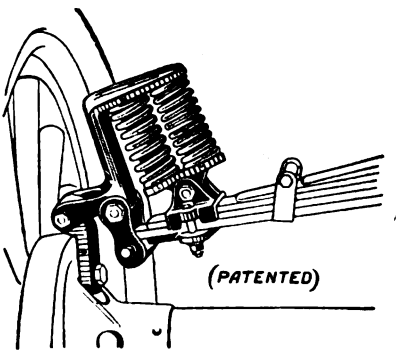
UNITED ENGINE & MFG. CO.
Hanover, Pa.

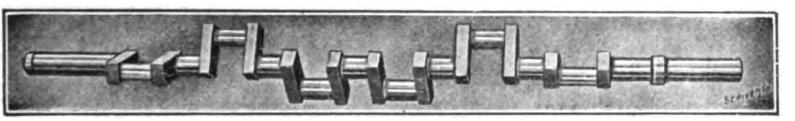
CHAMPION Shock Absorbers *for* FORD CARS

Made for both front and rear springs. Makes a Ford ride like a $5,000 car. Sold on a 30-day trial basis.

The "Champion" is different from all others. You ride on 8 large coil springs. Dealers, here is a fast selling accessory. Sells for $8 per pair. Set of four $15. Write for discount.

Champion Shock Absorber Sales Co.
Indianapolis - Indiana





GILL FORGED CRANK-SHAFTS

Anvil-forged, hammered out of Acid O. H., Vanadium, L. K. Nickel or Chrome Nickel Steel. Sizes to six inches diameter.

OLD CRANK-SHAFTS REGROUND

For fifty-six years we have maintained the highest standard for forged and finished steel products. We manufacture Automobile, Motor Trucks, Steam, Gasoline and Gas Engine parts.

We forge Gear Blanks from any kind of steel in any quantity. We make special frames and parts, such as cross-members, sub-frames, etc.

We forge Axles without welding, die forgings and parts of any description.

Our forge department is equipped with both oil and gas furnaces with pyrometer attachments to accurately control heats.

Send blue prints or specifications and let us quote on your requirements.

P. H. Gill & Sons Forge & Machine Works

Lorraine & Otsego Streets **BROOKLYN, N. Y.**

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CUTTERS, Milling (Continued)

Standard Tool Co., 6900-34 Central Ave., Cleveland, O.

Tabor Mfg. Co., 1740 Hamilton St., Philadelphia, Pa. "Taylor-Newbold."

Taylor-Newbold—See Tabor Mfg. Co.

Thurston Mfg. Co., 419 Eddy St., Providence, R. I.

Tindel-Morris Co., Eddystone, Pa.

Union Twist Drill Co., Chestnut Hill Ave., Athol, Mass.

Universal Boring Machine Co., 20 Tower St., Hudson, Mass.

Whitney Mfg. Co., Hartford, Conn. (See page 177.)

CUTTERS, Rod and Bar

(Hand Power)

Armstrong-Blum Mfg. Co., Chicago, Ill. "Marvel."

Belden Machine Co., Whalley Ave. & Tryon St., New Haven, Conn.

Braunsdorf-Mueller Co., 205 Madison St., Elizabeth, N. J.

Hercules—See Tucker, W. H. & C. F.

Marvel—See Armstrong-Blum Mfg. Co.

Merwin Mfg. Co., 310-20 E. 19th St., Erie, Pa. "Vulcan."

Schatz Mfg. Co., 17 Fairview Ave., Poughkeepsie, N. Y.

Tucker, W. H. & C. F., Hartford, Conn. "Hercules." (See page 223.)

Vulcan—See Merwin Mfg. Co.

Wallace Supplies Mfg. Co., 420 Orleans St., Chicago, Ill.

CUTTERS, Washer or Gasket

Bonney Vise & Tool Works, Allentown, Pa. "Cooper." (See page 293.)

Braunsdorf-Mueller Co., 205 Madison St., Elizabeth, N. J.

Cincinnati Tool Co., 1951 Waverly Ave., Norwood, O. "Hargrave."

Cooper—See Bonney Vise & Tool Works.

Goodell-Pratt Co., Greenfield, Mass. (See page 751.)

Hargrave—See Cincinnati Tool Co.

Hoggson & Pettis Mfg. Co., New Haven, Conn.

Kraeuter & Co., 571-85 18th Ave., Newark, N. J.

Lowentraut Mfg. Co., P., 36-54 Brenner St., Newark, N. J.

Mound Tool Co., Dept. D, Seventh & Hickory Sts., St. Louis, Mo. (See page 789.)

Smith, Otis A., Rockfall, Conn.

Stortz & Son, John, 210-12 Vine St., Philadelphia, Pa.

Widney & Widney, 161 W. Harrison St., Chicago, Ill.

CUTTING COMPOUNDS—See Lubricants, Cutting

CUTTING DIES—See Taps and Dies

CUTTING LUBRICANTS—See Lubricants, Cutting

CUTTING OILS—See Lubricants, Cutting

CYANIDE HARDENING — See Treating, Heat

CYLINDER BOLTS FOR FORDS — See Bolts, Engine

CYLINDER BORING MACHINES—See Machines, Boring

CYLINDER CASTINGS — See Castings, Gray Iron

CYLINDER CLEANING COMPOUNDS—See Compounds, Carbon Removing

CYLINDER CLEANING MACHINES—See Machines, Motor Decarbonizing

CYLINDER GRINDERS—See Grinders, Cylinder

CYLINDER-HEAD BOLTS FOR FORDS—See Bolts, Engine

CYLINDER-HEAD GASKETS FOR FORDS —See Gaskets, Cylinder-Head

CYLINDER HEADS FOR FORDS — See Heads, Special Cylinder

CYLINDER JIGS FOR FORDS—See Reamers and Jigs, Cylinder

CYLINDER LUBRICATING CUPS—See Lubricators, Cup Cylinder

CYLINDER LUBRICATORS—See Lubricators, Cup Cylinder

CYLINDER OILS—See Oils

CYLINDER REAMERS FOR FORDS—See Reamers and Jigs, Cylinder

CYLINDER REBORING TOOLS FOR FORDS—See Tools, Cylinder Reboring

CYLINDER REBORING MACHINES—See Machines, Portable Cylinder Reboring and Regrinding

CYLINDER REGRINDING MACHINES—See Machines, Portable Cylinder Reboring and Regrinding

CYLINDERS, Finished or Machined

(For cylinder castings in the rough—See Castings, Gray Iron)

Detroit Foundry Co., N. Grand Blvd. & Riopelle St., Detroit, Mich.

Ferro Machine & Foundry Co., 47 Hubbard Ave., Cleveland, O.

Fulton Foundry & Machine Co., 25 Furman St., Brooklyn, N. Y.

Muncie Foundry & Machine Co., Muncie, Ind. (See page 359.)

Sowers Mfg. Co., 1296 Niagara St., Buffalo, N. Y. (See page 243.)

Stroh Castings Co., Chene & Guoin Sts., Detroit, Mich.

Wainwright Engineering Corp., Connersville, Ind. (See page 479.)

CYLINDERS, Regrinding of

(See also Welding, Autogenous; also Machine Work)

Allen & Curtiss Co., W. Main St., Benton Harbor, Mich.

Anderson Auto Repair, H. S., 211-19 N. Sheridan Ave., Pittsburgh, Pa.

Auto Engine Works, University Ave. & Griggs St., St. Paul, Minn.

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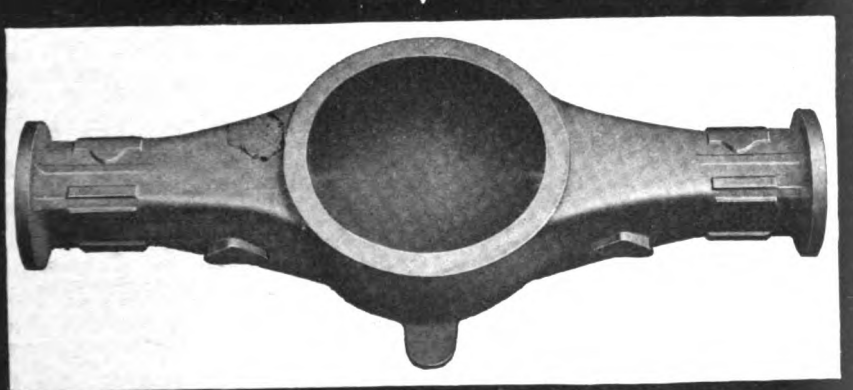
ELECTRIC
STEEL
CASTINGS



MICHIGAN
STEEL CASTING
COMPANY
DETROIT, MICHIGAN

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CYLINDERS, Regrinding of (Continued)

Bernhard & Turner Automobile Co., 506-12 W. Seventh St., Des Moines, Ia.

Blettner, Geo. H., 1401-05 Jackson Blvd., Chicago, Ill.

Bracken Co., Harry L., rear 27 S. State St., Salt Lake City, Utah.

Bridgeport Piston Ring Co., Connecticut Ave. & Third St., Bridgeport, Conn.

Burt Motor Car Co., W. J., Pico & Hope Sts., Los Angeles, Cal.

Butler Mfg. Co., 1120-24 E. Georgia St., Indianapolis, Ind.

Demster, W. R., 1816-18 Oak St., Kansas City, Mo.

Durham Co., P. J., 244 W. 49th St., New York, N. Y.

Dyer Co., G. H., Cambridge, Mass. (See page 505.)

Egge Machine Co., E. N., 730 Broadway, Plainview, Tex.

Evarts Machine Co., 14 Hicks St., Hartford, Conn.

Gabel Bros., 35 Third St., Fond du Lac, Wis.

Goodin Co., 335 S. Lawrence St., Wichita, Kans.

Green Engineering Co., Fourth & St. Clair Sts., Dayton, O.

Hale Co., Geo. C., 119-21 W. 14th St., Kansas City, Mo.

Hanke Iron & Wire Works, Albany, Grand & Chicago Aves., Chicago, Ill.

Hawkeye Truck Co., 2700 Floyd Ave., Sioux City, Ia. (See page 47.)

Heald Machine Co., 22 New Bond St., Worcester, Mass.

Hingley, J. A., 1816-18 Blake St., Denver, Colo.

Hope Machine Co., 2310-12 N. Second St., Philadelphia, Pa.

Houpert Machine Co., Harris Ave. & Marion St., Long Island City, N. Y. (See page 491.)

Johns, W. H., 908-12 W. Pico St., Los Angeles, Cal.

Johnson Gear Co., 735-37 Folsom St., San Francisco, Cal.

Kinslow, W. M., 415 W. Fifth St., Santa Ana, Cal.

Lake Sales Co., 1947 Broadway, New York, N. Y. (See page 591.)

Larkin Auto Machine Co., 455 Golden Gate Ave., San Francisco, Cal.

McCadden Machine Works, St. Cloud, Minn.

Merritt Co., S. Whyle, 133rd St. & 12th Ave., New York, N. Y.

Milwaukee Cylinder Grinding Co., Humboldt & Concordia Aves., Milwaukee, Wis.

Modern Auto Repair & Reconstruction Co., 4605 Olive St., St. Louis, Mo.

Motor Engineering Co., E. 61st St. & Curtiss Ave., Cleveland, O.

Neupert Mfg. Co., 82 Lark St., Buffalo, N. Y.

Nilson-Miller Co., 13th & Hudson Sts., Hoboken, N. J.

Patch Co., E. A., 17 Ipswich St., Boston, Mass.

Pondelick Bros., 215 S. Leavitt St., Chicago, Ill.

Rabaus & Toeller, Cedar Rapids, Ia.

Reus Bros. Co., 146 W. Mt. Royal Ave., Baltimore, Md.

Salter Motor Mfg. Co., 1516-18 Oakland Ave., Kansas City, Mo.

Salyer Tool Works, 330 Washington St., Newark, N. J.

Saucke Bros., 47 Franklin St., Rochester, N. Y.

Schmidt Co., B. L., Davenport, Ia. (See page 243.)

Scored Cylinder Works, 433 Golden Gate Ave., San Francisco, Cal.

Sioux City Welding & Machine Works, W. Seventh & Pearl Sts., Sioux City, Ia.

Stafford Motor Car Co., 2201-09 Campbell Ave., Kansas City, Mo.

Sterling Engine Co., 331 S. Clinton St., Chicago, Ill.

Sunderland Machinery Co., Omaha, Neb. (See page 243.)

Swenson Auto Co., 20th & Champa Sts., Denver, Colo.

Trindl Machine Works, 57-61 E. 24th St., Chicago, Ill. (See page 643.)

Wall Street Garage, 634-42 Wall St., Los Angeles, Cal.

Waterbury Welding Co., 1147 South Main St., Waterbury, Conn. (See page 243.)

Western Fixture Co., 573-75 E. Water St., Milwaukee, Wis.

White Auto Repair Co., 219 W. Fourth St., Chanute, Kans.

Wilkie's Garage & Machine Works, 208 W. Third St., Winona, Minn.

CYLINDERS, Repairing of Scored.

(See also Welding; also Cylinders, Regrinding of)

Catelain, Andre, 1446-48 Indiana Ave., Chicago, Ill.

Cincinnati Welding & Repair Co., 410-12 Richmond St., Cincinnati, O.

Eagle Machine Co., 24 N. Noble St., Indianapolis, Ind.

Lawrence & Co., L., 292 Halsey St., Newark, N. J.

McCrea & Jones, 30 Catherine St., Utica, N. Y.

Trindl Machine Works, 57-61 E. 24th St., Chicago, Ill. (See page 643.)

Wilkes-Barre Welding Co., 6 W. Ross St., Wilkes-Barre, Pa.

DASH CONTROLS—See Controls, Dash and Steering Column Carburetor

DASH CONTROLS FOR FORDS—See Adjusters, Carburetor or Dash Controls

DASH COWLS FOR FORDS—See Cowls, Dash

DASHBOARD GAGES—See Gages

DASHBOARD LAMPS—See Lamps, Electric, Dash

DASHBOARD METERS—See Meters, Dashboard, Gasoline

DASHBOARD MIRRORS—See Mirrors, Adjustable

DASHBOARD VENTILATORS FOR FORDS—See Ventilators, Dashboard

DASHBOARDS—See Dashes

DASHES, Metal

(Pressed or stamped metal dash or instrument boards)

A. Z. Co., 530 W. 56th St., New York, N. Y. (See page 563.)

Hayes Mfg. Co., 481 Maybury Grand Ave., Detroit, Mich.

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We do

Cylinder Regrinding and Welding

We can also supply

Oversize Pistons
Oversize Rings
and
Oversize Piston Pins

for several hundred makes and models of cars.

Waterbury Welding Co.
1147 South Main St.
Waterbury, Conn.

SPECIALIZING in Cast Iron Seamless Jacketed Apparatus. We confine our activities in the automotive field to

Cylinder Castings Only

We developed a Special Pure Cast Iron of peculiar analysis for our work having wonderful wearing, machining and strength properties.

Analysis of materials used and daily analysis of product together with carefully kept production records secure uniformity of product which can only be insured by our methods.

Sowers Manufacturing Co.
ENGINEERS AND FOUNDERS
1296 Niagara St. Buffalo, N. Y.

Grinding Cylinders

OUR SPECIALTY

Auto Truck and Tractor Motors Reground and fitted with new Cast Iron or Magnalite Pistons.

Quality Work **Prompt Service**
Special Prices on Ford Jobs

GARAGE EQUIPMENT

Lathes, Drills, Shapers, Millers, Etc.
Small Tools and Supplies.

We Carry LARGE STOCKS

Write for Catalogue

SUNDERLAND
MACHINERY COMPANY
OMAHA, U. S. A.

The Schmidt Internal Grinder

REGRINDS
AUTOMOBILE
TRUCK
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TRACTOR
MOTORBOAT
MOTORCYCLE
CYLINDERS

Accurate—Fast—Dependable

Prepare now to enjoy the vast business which awaits you

B. L. SCHMIDT CO.
DAVENPORT, IOWA

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DASHES, Wood

(Laminated wood dash or instrument boards)

Almapee Veneer & Seating Co., Algoma, Wis.
American Veneer Co., 1501 Clinton St., Hoboken, N. J.
Dann Bros. & Co., 80-88 Franklin St., New Haven, Conn.
Eggers Veneer Seating Co., F., 19th St. & Jefferson Ave., Two Rivers, Wis.
Grand Rapids Veneer Works, 800-900 Front St., Grand Rapids, Mich.
Haberkorn & Co., C. H., Brooklyn & Eighth Sts., Detroit, Mich.
Hanson-Ward Veneer Co., Bay City, Mich. (See page 261.)
Hartford Pattern & Model Co., 120 Allyn St., Hartford, Conn.
Indiana Veneer & Panel Co., New Albany, Ind.
Kundts Co., Theodor, Cleveland, O. (See page 105.)
Louisville Veneer Mills, 1122-40 Fulton St., Louisville, Ky.
New Jersey Veneer Co., 258 W. Railway Ave., Paterson, N. J.
Roddis Lumber & Veneer Co., Marshfield, Wis.
Standard Cabinet Mfg. Co., Peru, Ind.
Wisconsin Seating Co., New London, Wis.

DAZZLE DIMMERS—See Dimmers, Glare

DECALCOMANIA TRANSFERS — See Transfers, Decalcomania

DECARBONIZING MACHINES—See Machines, Motor Decarbonizing

DEFLATING TOOLS—See Tools, Tire Deflating

DEFLATORS, TIRE—See Tools, Tire Deflating

DEFLECTING LENSES—See Dimmers or Shades, Headlight

DEFLECTORS, Exhaust, for Fords

(Stamped steel attachment for end of exhaust pipe to enable exhaust gases to be deflected away from spare tires or any part of car)

Corcoran Mfg. Co., 4634 Spring Grove Ave., Cincinnati, O.
Metal Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.
Nelson Mfg. Co., A., 2700 Southport Ave., Chicago, Ill.
Worthington, A. P., 700 N. Main St., Los Angeles, Cal.

DEFLECTORS, Heat, for Fords

(Rubber or metal deflectors to attach to front floor board to prevent heat from motor entering body)

Atlas Specialty Mfg. Co., 16-22 E. 24th St., Chicago, Ill. (See page 123.)
Franklin Rubber Co., 134 Federal St., Boston, Mass.
Home Light Co., 3353 Milwaukee Ave., Chicago, Ill.
Metal Specialties Mfg. Co., 338-52 N. Kedzie Ave., Chicago, Ill. "Presto." (See page 333.)
Presto—See Metal Specialties Mfg. Co.

DEFLECTORS, LIGHT—See Dimmers or Shades

DEFLECTORS, MUD, FOR FORDS—See Pans, Rediator Splash

DEFLECTORS, Oil, for Fords

Perfector Mfg. Co., Baker-Detwiler Bldg., Los Angeles, Cal.

DEMOUNTABLE HUBS FOR FORDS—See Hubs, Demountable

DEMOUNTABLE RIM BOLTS—See Bolts, Special Demountable Rim

DEMOUNTABLE RIM CONTRACTING TOOLS—See Tools, Demountable Rim Contracting

DEMOUNTABLE RIM SHIMS—See Plates, Demountable Rim Wedge

DEMOUNTABLE RIM WEDGE PLATES—See Plates, Demountable Rim Wedge

DEMOUNTABLE RIMS—See Rims, Removable

DEMOUNTABLE RIMS FOR FORDS—See Rims, Demountable

DEMOUNTABLE WHEEL CARRIERS—See Holders, Tire

DEMOUNTABLE WHEEL CARRIERS FOR FORDS—See Holders, Wheel

DEMOUNTABLE WHEELS—See Wheels, Wire

DEMOUNTABLE WHEELS FOR FORDS—See Wheels, Demountable; also Hubs, Demountable

DENATURED ALCOHOL—See Alcohol, Denatured

DEPTH GAGES—See Gages, Depth

DETACHABLE MOTORS, MOTOR BOAT—See Motors, Motor Boat Outboard

DETACHABLE RIMS—See Rims, Removable

DEVICES, KEROSENE, FOR FORDS—See Carburetors, Kerosene; also Heaters, Mixture; also Manifolds, Special and Jacketed

DIALS, CLOCK—See Dials, Luminous

DIALS, Luminous

(For Clocks, Gages and Meters)

Luma—See Radium Dial Co.
R L M—See Radium Luminous Material Corp.
Radium Dial Co., Forbes & Meyran Aves., Pittsburgh, Pa. "Luma."
Radium Luminous Material Corp., 55 Liberty St., New York, N. Y. "R. L. M." (See page 245.)

DIALS, SPEEDOMETER—See Dials, Luminous

DIE CAST BEARINGS—See Castings, Die

DIÉ CASTINGS—See Castings, Die

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R. L. M. Production of Radium Never So Great! Variety and Extent of R. L. M. Treatment Never Approached! No Shortage of Radium in Sight!

APPREHENSION of the Bureau of Mines as to the supply of radium has found recent expression. Data in the hands of this company—the world's largest producer of radium luminous material—disprove these statements, and we take this opportunity of presenting the exact facts to our customers, past, present, and future, in the automotive industries who are considering the utility and selling appeal of luminous dials on gasoline gauges and dash instruments.

This company was organized for a long life, a policy which led to the purchase of mines of such extent as to guarantee a supply of radium sufficient for the production of luminous dials, etc., on a practically unlimited scale.

The Radium Luminous Material Corporation has recently added 75% to its productive capacity—convincing evidence that our supply of radium and of R.L.M. is assured.

In the past two years we have R.L.M.: treated 2,500,000 watch dials; 300,000 units for the United States Government; important shipments for our Allies, to say nothing of clock faces, automobile instruments, light finders, etc.

Still our available reserve of radium is untouched.

We now hold a ten months' reserve of tubed radium and have supplies of radium ore, mined, stacked, and ready for shipment to our reduction plants, in quantities equal to the world's entire radium production in any one year prior to 1917.

Were the demands for R.L.M. to be trebled we could meet them without drawing on our reserves of either tubed radium or ore appreciably.

Danger of a radium shortage is therefore remote so far as R.L.M. products are concerned.

Radium Luminous Material Corporation

55 Liberty Street
New York

SEES AT NIGHT

Plants: Orange, N. J.
Boonton, N. J.
Mines: Colorado, Utah

Cripple Creek Mine (R. L. M. owned), showing reserve piles of ore containing a quantity of radium equal to the world's entire production for any year prior to 1917.

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DIE STOCKS—See Stocks, Die

DIES, SCREW CUTTING—See Taps and Dies

DIFFERENTIAL GEARS—See Gears, Differential

DIFFERENTIALS, COMPLETE—See Gears, Differential

DIMMERS, Glare

(Colored Glass or Celluloid Attachment for Windshield to dim the glare from approaching headlights)

American Glarekiller Corp., 1420 Chestnut St., Philadelphia, Pa.

Brett Dimmer Co., A. H., Mason City, Ia.

Evergood—See Grossman Mfg. Corp.

Fitzgerald-Noble Co., 437 C St., Richmond, Cal. "Solarscope."

Freeman Glare-Killer Corp., Bank of Commerce Bldg., Norfolk, Va.

Glaroscope—See Randall-Faichney Co.

Grossman Mfg. Corp., Emil, Bush Terminal Bldg. No. 20, Brooklyn, N. Y. "Evergood."

Nasco—See National Souvenir Co.

National Souvenir Co., 218-19 N. Cedar St., Owatoma, Minn. "Simplex," "Nasco."

Perkins & Co., Grand Rapids, Mich.

Portland Sales Co., 15 Chardon St., Boston, Mass.

Randall-Faichney Co., 76 Atherton St. (Jamaica Plain), Boston, Mass. "Glaroscope.

Reynolds Safety Light Shade Co., Oneida, N. Y.

Sales Publicity Co., Carlton Ct. Bldg., Buffalo, N. Y.

Simplex—See National Souvenir Co.

Solarscope—See Fitzgerald-Noble Co.

Staude Mfg. Co., E. G., 2675 W. University Ave., St. Paul, Minn.

DIMMERS or Shades, Headlight

(Diffusing and deflecting lenses or glasses, special shades and reflectors, hoods and screens, two filament bulbs, etc.)

Aderente—See Jay & Dee Specialty Co.

Amco—See Art Metal Mfg. Co.

Ames—See Heinze Electric Co.

Amesbury Bent Glass Co., Carriage Ave., Amesbury, Mass.

Art Metal Mfg. Co., E. 61st St. & Curtis Ave., Cleveland, O. "Amco."

Avery Portable Lighting Co., 851 National Ave., Milwaukee, Wis.

Axiom Lens Mfg. Co., 906 Teutonia Ave., Milwaukee, Wis.

Benjamin Electric Mfg. Co., Chicago, Ill. (See page 139.)

Brett Dimmer Co., A. H., Mason City, Ia.

Butterfly—See Sparta Mfg. Co.

Cassidy Co., Edward A., 280 Madison Ave., New York, N. Y. (Sales Department for Corning Glass Works, Corning, N. Y.) "Conaphore." (See page 71.)

Chicago Eye Shield Co., Chicago, Ill. "Mel-O-Lite." (See page 689.)

Clamert Mfg. Co., East End Trust Bldg., Pittsburgh, Pa.

Clear Light—See Woodworth Mfg. Corp.

Conaphore—See Cassidy Co.

Corning Glass Works—See Cassidy Co.

Crew-Levick Co., 111 N. Broad St., Philadelphia, Pa. "Fractors."

Dakin Dimmer Co., 739 13th St., N. W., Washington, D. C.

Dannenhirsch Co., 1905 W. Dauphin St., Philadelphia, Pa. "Danno."

Danno—See Dannenhirsch Co.

Dazzlenots—See Servus Selling Co.

Dillon Lens & Mfg. Co.—See National Distributing Co.

Dim Auto Lite Switch Co., Monroe, Mich.

Dim-Lite—See Watson Paint & Glass Co.

Dimit—See Suburban Lighting & Gas Engine Co.

Distributors & Manufacturers Co., 82 W. Washington St., Chicago, Ill. "Monarch."

Divergo—See Rotary Products Co.

Doe Battery & Novelty Co., S. Water St., Kent, O.

Dubuque Glass Co., Dubuque, Ia.

Dwelle-Kaiser Co., 237-51 Elm St., Buffalo, N. Y.

Eclipse—See Vesta Accumulator Co.

Eco—See Western Mfg. Co.

Faw, J. H., 37 Warren St., New York, N. Y. "Lennon." (See page 387.)

Fitzgerald-Noble Co., 437 C St., Richmond, Cal. "Simpl-ur."

4-A Products Co., Charles Bldg., Denver, Colo.

Fractors—See Crew-Levick Co.

Glar-Mask—See Zorger Lens Co.

Glare-Off Co., 90 West St., New York, N. Y.

Glaroscope—See Randall-Faichney Co.

Glur Kilr—See Zorger Lens Co.

Haskins-Slonaker Co., Wheeling, W. Va.

Heinze Electric Co., Lowell, Mass. "Ames."

Holophane Glass Co., 340 Madison Ave., New York, N. Y.

Invincible—See Peters & Herron Dash Co.

Iowa Optical Co., New London, Ia.

Jay & Dee Specialty Co., 41 Park Row, New York, N. Y. "Aderente."

Johanson, Emil G., 1123 Wells St., Chicago, Ill.

Koch Auto Supply Co., 707 Second Ave., S. Minneapolis, Minn. (Sole Distributors for Wm. J. Thul Co., Minneapolis, Minn.) (See page 255.)

Lancaster Lens Co., 220-26 W. Main St., Lancaster, O. "Star."

Lawco—See Lawson Co.

Lawson Co., F. H., Dept. D., Cincinnati, O. "Lawco." (See page 663.)

Legal-Brite—See Vesta Accumulator Co.

Legalite Corporation, 120 Boylston St., Boston, Mass.

Lennon—See Faw, J. H.

Lenslite—See Manufacturers Glass Co.

Leonard Electric Co., Ward, Mt. Vernon, N. Y. "Nodaz."

Long Bros., Broadway & Buckeye St., Kokomo, Ind. "Long Way."

Long Way—See Long Bros.

McKee Glass Works, Jeannette, Pa.

Macbeth-Evans Glass Co., Chamber of Commerce Bldg., Pittsburgh, Pa.

Manufacturers Glass Co., 38 S. Dearborn St., Chicago, Ill. "Lenslite."

Martin Mfg. Co., Forest Rose Ave., Lancaster, O.

Mel-O-Light—See Chicago Eye Shield Co.

Mock & Hardy, 111 W. Monroe St., Chicago, Ill. (Sole Distributors for Raylo Dimmer Co., Indianapolis, Ind.)

Monarch—See Distributors & Manufacturers Co.

Monarch Carriage Goods Co., 2333-44 Spring Grove Ave., Cincinnati, O.

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A pleased customer is a better salesman than a policeman.

On your own car—at our risk—try a pair of Shaler Roadlighters. Then you'll know better than we can tell you why every user recommends them to his friends. Roadlighters give better light than you can get in any other way. They comply with the law, yet it doesn't require a law to make them sell and a policeman to make people use them. Don't confuse them with lenses that merely dim or diffuse your light to protect the other fellows you meet on the road.

SHALER ROADLIGHTER

Kills the Other Fellow's Glare

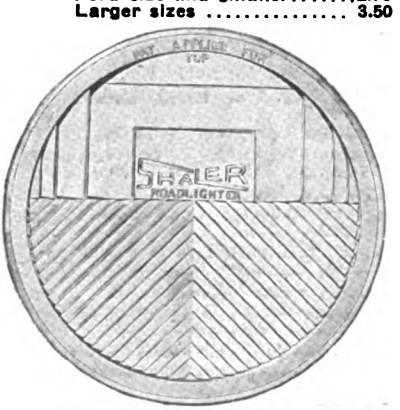
It throws a brilliant, intense beam far ahead just like your present headlights do, but keeps the beam below the 42 inch limit. It throws concentrated (not diffused) beams of light on the edges of the road so that you can see the ditch all the time—even when meeting headlights that glare. It lights the road through fog or dust.

With most other lenses you have a weaker driving light than with clear glass. All of them put you at a disadvantage when you meet glaring lights. The Roadlighter actually improves your light—not by making something from nothing, but by efficiently using what your lamps produce.

Ford size and smaller.....$2.75
Larger sizes 3.50

Dealers write for FREE TRIAL

Forget your experience with other lenses and try the Roadlighter on your own car. You be the judge. We know what your decision will be, because we know what many thousands of other dealers think about it and why they sell Roadlighters.



The Guarantee of C. A. SHALER CO.

9902 Fourth St. Waupun, Wis.

is Proof of Superiority.
You Know Shaler Vulcanizers.

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DIMMERS or SHADES, Headlight (Continued)

More-Lite—See Smith Glass Co.

National Distributing Co., Oliver Bldg., Pittsburgh, Pa. (Sole Distributors for Dillon Lens & Mfg. Co., Wheeling, W. Va.)

Newlite Lens Co., 1539 W. Harrison St., Chicago, Ill.

Nodaz—See Leonard Electric Co.

Noglare Auto Lens Co., 148 Fifth St., Portland, Ore.

No-Glare—See Perrin Mfg. Co.

No-Glare—See Victoria Lamp Works.

No-Glar-On Co., Watertown, N. Y.

Nu-Ra—See Prismolite Co.

O-U-Lite Co., Racine, Wis.

Ordnance Dimmer Co., Meridian Life Bldg., Indianapolis, Ind.

Osgood Lens & Supply Co., Dept. 464, 2007 Michigan Ave., Chicago, Ill. (See page 251.)

Palmer Glare Screen Co., 1413 Brownell Ct., Cleveland, O.

Parabolight—See Zorger Lens Co.

Parrish & Co., S. H., 202 S. Clark St., Chicago, Ill.

Perrin Mfg. Co., Detroit, Mich. "No-Glare."

Peters & Herron Dash Co., Gift St., Columbus, O. "Invincible."

Primolite Co., 1112-14 Central Ave., Indianapolis, Ind.

Prismolite Co., Fourth & Gay Sts., Columbus, O. "Nu-Ra," "Sun-Ray."

Punch—See Trieber-Punch Co.

Purfex Mfg. Co., 126 N. Fourth St., Philadelphia, Pa.

Rand Reflector Co., 191 Merrimack St., Haverhill, Mass.

Randall-Faichney Co., 76 Atherton St. (Jamaica Plain), Boston, Mass. "Glaroscope."

Raylo Dimmer Co.—See Mock & Hardy.

Reynolds & Co., Harry H., 641 E. 39th St., Chicago, Ill. "Sof-Lite."

Roadlighter—See Shaler Co.

Rosco—See Rosen & Co.

Rosen & Co., A. W., 610-14 Broadway, New York, N. Y. "Rosco."

Rotary Products Co., 1013-15 S. Los Angeles St., Los Angeles, Cal. "Divergo."

S. & K. Specialty Co., Newark, N. J.

Saferlite Lens Co., 220 Fifth Ave., New York, N. Y. (See page 251.)

Scatter Light Lens Co., 209 Washington St., Newark, N. J.

Shaler Co., C. A., 09902 Fourth St., Waupun, Wis. "Roadlighter." (See pages 247, 745 and 747.)

Simpl-ur—See Fitzgerald-Noble Co.

Smith Glass Co., L. E., Mount Pleasant, Pa. "More-Lite."

Sof-Lite—See Reynolds & Co.

Sparta Mfg. Co., Grand Rapids, Mich. "Butterfly."

Star—See Lancaster Lens Co.

Stewart-Warner Speedometer Corp., Chicago, Ill. (See pages 499.)

Stopglare, Ltd., 270 Court St., Buffalo, N. Y.

Stryker Deflector Co., 70 W. Chippewa St., Buffalo, N. Y.

Suburban Lighting & Gas Engine Co., Summit & Lagrange Sts., Toledo, O. "Dimmit."

Sun-Ray—See Prismolite Co.

Sutterley & Co., G. T., Second St. & Columbia Ave., Philadelphia, Pa.

Thul Co.—See Koch Auto Supply Co.

Tobey, Wm. L., 9 Lewis St. (E. Boston), Boston, Mass.

Totalux Co., Colby Abbott Bldg., Milwaukee, Wis.

Trieber-Punch Co., 1469 Michigan Ave., Chicago, Ill. "Punch."

Vesta Accumulator Co., 2100 Indiana Ave., Chicago, Ill. "Eclipse," "Legal-Brite."

Victoria Lamp Works, Union Hill, N. J. "No-Glare."

Warner-Patterson Co., 914 S. Michigan Ave., Chicago, Ill. (See page 251.)

Watson Paint & Glass Co., 101-03 W. Ohio St., Pittsburgh, Pa. "Dim-Lite."

Wells Mfg. Co., R. C., Fond du Lac, Wis.

Western Mfg. Co., Oskaloosa, Ia. "Eco."

Wilson, R. F., Foster Bldg., Denver, Colo.

Woodworth Mfg. Corp., Niagara Falls, N. Y. "Clear Light." (See page 721.)

Zorger Lens Co., 323 N. Neil St., Champaign, Ill. "Glur-Kilr," "Glar-Mask," "Parabolight."

DIMMERS or Shades, Headlight, for Fords

(Diffusing and deflecting lenses or glasses, special shades and reflectors, hoods and screens, two filament bulbs, etc.—See also Regulators, Headlight)

Amesbury Bent Glass Co., Carriage Ave., Amesbury, Mass.

Boko—See Defiance Welding Co.

Defiance Welding Co., Defiance Bldg., Defiance, O. "Boko."

Detroit Starter Co., 30-32 E. Larned St., Detroit, Mich. "Semibrite."

Doe Battery & Novelty Co., S. Water St., Kent, O.

Eco—See Western Mfg. Co.

Han-D-Dim Co., 1126 E. 63d St., Chicago, Ill.

Invincible—See Peters & Herron Dash Co.

Lawco—See Lawson Co.

Lawson Co., F. H., Dept. D, Cincinnati, O. "Lawco." (See page 663.)

O-U-Lite Co., Racine, Wis.

Peters & Herron Dash Co., Gift St., Columbus, O. "Invincible."

Semibrite—See Detroit Starter Co.

Western Mfg. Co., Oskaloosa, Ia. "Eco."

DIRECTION INDICATING SIGNALS—See Signals, Direction Indicating or Traffic

DIRIGIBLES—See Section I

DISAPPEARING STEPS—See Steps, Special Folding

DISC GRINDERS—See Grinders, Disc

DISCS, CLUTCH—See Discs, Steel Clutch

DISCS, FABRIC CLUTCH—See Lining, Brake

DISCS, FRICTION—See Frictions, Fiber

DISCS or Fins, Radiator

Crosby Co., Buffalo, N. Y. (See page 669.)

Worcester Pressed Steel Co., Worcester, Mass.

DISCS, Steel Clutch

Bossert Corp., Utica, N. Y. (See page 363.)

Buffalo Pressed Steel Co., Buffalo, N. Y. (See page 473.)

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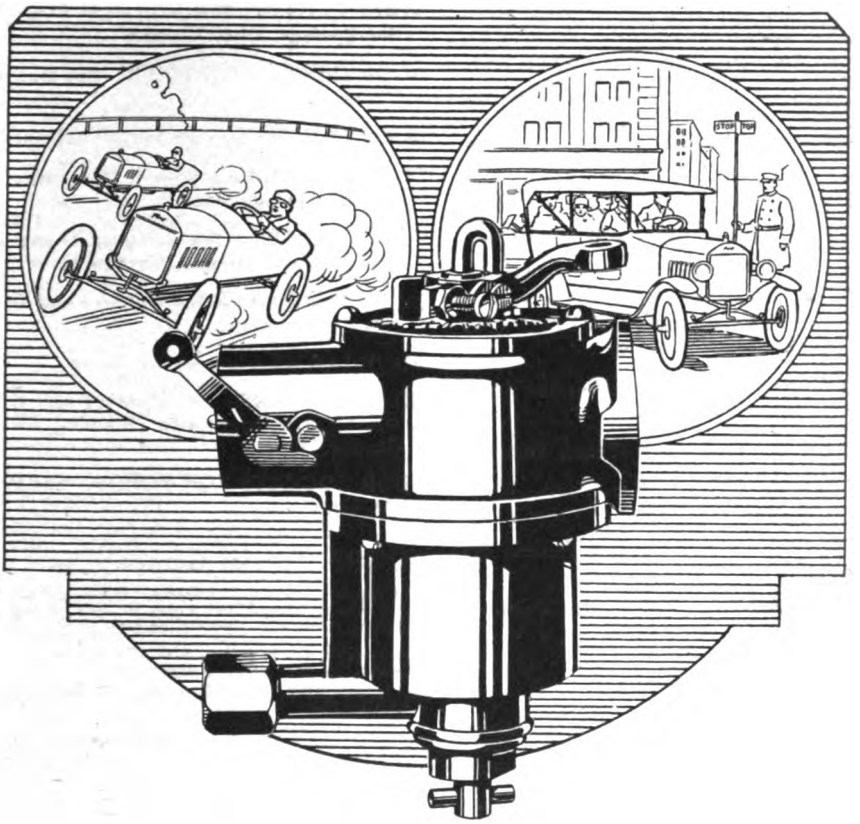

THE LIBERTY CARBURETOR

EFFICIENT, ECONOMICAL, SIMPLE

The Liberty is a simple, efficient carburetor which has demonstrated its merit under the most trying tests. It is the final result of months of study, research and experimenting. It marks the point of highest attainment in carburetor construction.

It possesses but three principal parts. It is so compact that it can't get out of adjustment and nothing less than an accident can put its parts out of alignment.

It increases mileage, reduces vibration, and cuts down gasoline consumption.

It works on the cold air principle and injects a vapor into the cylinders which still possesses all its latent explosive quality.

The Liberty sells for $12.50 installed with a liberal margin of profit for the jobber and dealer. They are sold at a positive guarantee of satisfaction or your money back. It is the real live jobber and dealer proposition of the year.

THE LIBERTY CARBURETOR COMPANY

Dix and Vinewood Avenues **DETROIT, MICHIGAN**

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DISCS, Steel Clutch (Continued)

Disston & Sons, Henry (Tacony), Philadelphia, Pa.
Gier Pressed Steel Co., Lansing, Mich. (See page 505.)
Konigslow Mfg. Co., Otto, 3701 Perkins Ave., Cleveland, O.
Moltrup Steel Products Co., Beaver Falls, Pa.
Simonds Mfg. Co., North St., Fitchburg, Mass.
Worcester Pressed Steel Co., Worcester, Mass.

DISCS, Wheel

Empire Auto Specialty Co., 1622 S. Wabash Ave., Chicago, Ill.
Schutte Body Co., Charles, 111 E. King St., Lancaster, Pa.

DISTANCE RECORDING METERS—See Meters, Distance Recording

DISTANCE RODS FOR FORDS—See Rods, Radius

DISTILLED WATER—See Water, Distilled

DISTRIBUTOR PARTS—See Parts, Magneto, Coil and Distributor

DISTRIBUTORS, SPARK—See Timers, Ignition

DIVIDERS AND CALIPERS—See Calipers and Dividers

DOGS, Lathe

Armstrong Bros. Tool Co., 304 N. Francisco Ave., Chicago, Ill. (See page 773.)
Besley & Co., Charles H., 118-24 N. Clinton St., Chicago, Ill.
Billings & Spencer Co., Laurel & Park Sts., Hartford, Conn.
Bonney Vise & Tool Works, Allentown, Pa. "Indispensable." (See page 293.)
Collmer Bros., 105 Vistula Ave., South Bend, Ind. "Le Count."
Indispensable—See Bonney Vise & Tool Works.
Le Count—See Collmer Bros.
Le Count, Wm. G., Merritt St., South Norwalk, Conn.
Lutz-Webster Engineering Co., 31st St. & Grays Ferry Rd., Philadelphia, Pa.
Mark Mfg. Co., Chicago, Ill.
National—See Oneida National Chuck Co.
O. K. Tool Holder Co., Shelton, Conn.
Oneida National Chuck Co., Oneida, N. Y. "National."
Oswego Tool Co., 119-27 W. First St., Oswego, N. Y.
Phoenix Hardware Co., 49-53 Illinois St., Buffalo, N. Y.
Ready Tool Co., 624 Iranistan Ave., Bridgeport, Conn. "Red-E."
Red-E—See Ready Tool Co.
Union Elevator & Machine Co., 227 W. Erie St., Chicago, Ill.
Union Tool Co., Orange, Mass.
Vulcan—See Williams & Co.
West Steel Casting Co., 805-41 E. 70th St., Cleveland, O.
Williams & Co., J. H., 38 Richards St., Brooklyn, N. Y. "Vulcan." (See page 433.)

DOME LIGHTS—See Lights, Electric Dome

DOOR ANTI-RATTLERS—See Anti-Rattlers, Door

DOOR CLOSING SPRINGS FOR FORDS—See Springs, Door Closing

DOOR CURTAIN FITTINGS—See Openers, Curtain

DOOR HANDLES—See Handles, Door

DOOR HANGERS—See Hangers and Hinges, Garage Door

DOOR HINGES—See Hinges, Door; also Hangers and Hinges, Garage Door

DOOR HOLDERS—See Holders and Openers, Garage Door

DOOR LOCKS—See Locks, Door

DOOR OPENERS—See Holders and Openers, Garage Door; also Openers, Electric Garage Door

DOOR POCKETS FOR FORDS—See Pockets, Door

DOORS, Special Garage

(For special garage door hangers, hinges and holders—See Hangers, Garage Door; also Holders and Openers, Garage Door; also Openers, Electric Garage Door)

Cornell Iron Works, 601 W. 26th St., New York, N. Y. (See page 531.)
St. Louis Fire Door Co., 1512 Clark Ave., St. Louis, Mo.

DOPE, AEROPLANE WING—See Coatings, Wing; also Varnishes; also Paints, Fireproof

DOPE INJECTORS—See Guns, Grease

DOUBLE TREAD TIRE STITCHING MACHINES—See Machines, Double Tread Tire Stitching

DRAG LINKS—See Connections, Steering

DRAG LINKS FOR FORDS—See Links, Steering

DRESSERS, Emery Wheel

Baldwin, Tuthill & Bolton, 465-505 Sixth St., Grand Rapids, Mich.
Bandler & Sons, Bernard, 220 Fifth Ave., New York, N. Y.
Braunsdorf-Mueller Co., 205 Madison St., Elizabeth, N. J.
Calder, Geo. H., 628 N. Prince St., Lancaster, Pa.
Chicago Screw Co., Homan Ave. & Fillmore St., Chicago, Ill. "Huntington." (See pages 593 and 601.)
Clizbe Bros. Mfg. Co., Plymouth, Ind. "Crown."
Collmer Bros., 105 Vistula Ave., South Bend, Ind. "Huntington."
Crafts, Arthur A., 125 Summer St., Boston, Mass.
Crown—See Clizbe Bros. Mfg. Co.
Desmond-Stephan Mfg. Co., Urbana, O. "Diamo-Carbo;" "Sherman," "Huntington." (See page 287.)

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The Ideal Light

The Warner-Lenz gives a wide-spread flood light, just as daylight does. It reaches high and low, to light the road signs, the upgrades and down grades—it lights the curves and turns.

Over one million users have adopted this all-revealing diffused light.

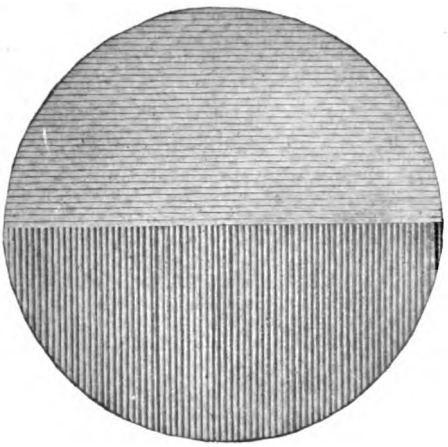
It meets all legal laws as well as the rules of road courtesy.

WARNER-PATTERSON CO.
(Formerly The Warner-Lenz Co.)
914 S. Michigan Ave. Chicago

WARNER-LENZ

This is A. P. Warner of the Warner Auto-Meter Fame and Inventor of the Magnetic Speedometer

Saferlite Deflecting Lens



High projection between 100 and 400 feet ahead, with sufficient spread to cover the traffic width of road.

PRICES
Up to 9"—$1.00 per Pair
Over 9"—$1.25 per Pair

Prices in and West of the Rockies 50 cents per pair higher.

Write for circular and our nearest distributing point.

SAFERLITE LENS COMPANY
220 Fifth Avenue, Room 1714, New York City

This shows inner side of lens. The outer side is as smooth as a window pane.

More Road Light No Glare, Big Sales

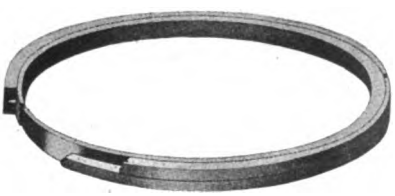
The Osgood Lens gives 74% more road light compared with plain lens; 910% greater road light compared with a ground lens. This new efficiency is verified by country's foremost authorities.

The biggest seller in 1917. Sales are increasing daily, helped by national advertising. Dealers, write for interesting sales plan on this wonderful lens.

OSGOOD LENS & SUPPLY CO.
Dept. 467, 2007 Michigan Ave., Chicago

OSGOOD LENS
GRAVATH LONG DISTANCE TYPE

KURTZ
PISTON RINGS



give greater compression, save gasoline and oil, eliminate carbon troubles. The most scientifically constructed and perfectly finished rings made.

THE CANTON AUTO PARTS MFG. CO.
CANTON OHIO

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DRESSERS, Emery Wheel (Cont'd)

Detroit Screw Works, 368 Franklin St., Detroit, Mich. "Huntington."
Diamo-Carbo—See Desmond-Stephan Mfg. Co.
Diamond Saw & Stamping Works, 357-61 Seventh St., Buffalo, N. Y. "Sterling."
Diamond Tool Co., 326 W. Madison St., Chicago, Ill.
Diamond Tool & Die Co., 438 Asylum St., Hartford, Conn.
Erie Tool Works, 640 W. 12th St., Erie, Pa.
Huntington—See Chicago Screw Co.
Huntington—See Collmer Screw Co.
Huntington—See Desmond-Stephan Mfg. Co.
Huntington—See Detroit Screw Works.
Huntington—See Mark Mfg. Co.
Mark Mfg. Co., Chicago, Ill. "Huntington."
North Wales Machine Co., Center & Elm Aves., North Wales, Pa.
Osgood, J. L., 45 Pearl St., Buffalo, N. Y.
Peninsula Emery Wheel Co., Detroit, Mich.
Reed Mfg. Co., Eighth St. & E. & P. Tracks, Erie, Pa.
Sherman—See Desmond-Stephan Mfg. Co.
Standard Tool Co., 6900-34 Central Ave., Cleveland, O.
Sterling—See Diamond Saw & Stamping Works.
Sterling Grinding Wheel Co., Tiffin, O.
Tanite Co., Stroudsburg, Pa.
Vincent Steel Process Co., 751 Bellevue Ave., Detroit, Mich.
Warren Axe & Tool Co., Warren, Pa.
Western Tool & Mfg. Co., Springfield, O.
Wrigley Co., Thomas, 416 S. Dearborn St., Chicago, Ill.

DRESSING, BELT—See Dressing, Clutch

DRESSING, Clutch and Belt

(For leather faced clutches and leather fan belts)

Armiger Chemical Co., 2155-57 Austin Ave., Chicago, Ill. "Rex."
Benoit, Constant A., Brooklyn, N. Y. "Permatex." (See page 169.)
Blue Ribbon—See Jobbers' Mfg. Co.
Camo—See Perkins-Campbell Co.
Cleveland Auto-Clutch Dressing Co., Cleveland, O. "Slipnot."
Cook, Geo. E., 2322 Broadway, New York, N. Y.
Durkee-Atwood Co., Minneapolis, Minn. "Rie-Nie."
Echo Motor Co., Tonawanda, N. Y.
Ensign Refining Co., 10605 Quebec Ave. Cleveland, O.
Hall-Thompson Co., Hartford, Conn. "Wonder Worker." (See page 739.)
Hollingshead Co., R. M., 112 N. Ninth St., Camden, N. J. "Whiz."
Jobbers' Mfg. Co., 327 S. La Salle St., Chicago, Ill. "Blue Ribbon."
Northwestern Chemical Co., 610 State St., Marietta, O. "Norwesco." (See page 205.)
Norwesco—See Northwestern Chemical Co.
Owl—See Western Chemical Mfg. Co.
Perkins-Campbell Co., 634 Broadway, Cincinnati, O. "Camo." (See page 227.)
Permatex—See Benoit, Constant A.
Rex—See Armiger Chemical Co.
Rie-Nie—See Durkee-Atwood Co.
Slipnot—See Cleveland Auto-Clutch Dressing Co.
Uno Mfg. Co., Royal Ins. Bldg., Chicago, Ill.
Van Tilburg Oil Co., 2424-28 University Ave., S. E., Minneapolis, Minn. "Wang."
Wang—See Van Tilburg Oil Co.
Western Chemical Mfg. Co., 151 Sixth St., Milwaukee, Wis. "Owl."
Whiz—See Hollingshead Co.
Wonder Worker—See Hall-Thompson Co.

DRESSING, Leather

(For refinishing leather tops or upholstery)

American Lacquer Co., Bruce Ave., Bridgeport, Conn.
Armiger Chemical Co., 2155-57 Austin Ave., Chicago, Ill. "Rex."
Arnold, N. B., 1 Sigourney St., Brooklyn, N. Y. "Silkup."
Arnstein, Eugene, 45 W. 26th St., Chicago, Ill. "Century."
Auto Products Mfg. Co., Buffalo, N. Y. "Rub-R-Tite," "Leather-Like," "Nom-Gloss." (See page 255.)
Autonamel Co., 94-97 St. Paul St., Rochester, N. Y.
Banner—See Cortland Specialty Co.
Baum's Gasoline Co., 104 N. George St., Rome, N. Y.
Bay State—See Wadsworth, Howland & Co.
Be-Be-Co.—See Boston Blacking Co.
Benoit, Constant A., Brooklyn, N. Y. (See page 169.)
Bilchaco—See Billings-Chapin Co.
Billings-Chapin Co., Cleveland, O. "Bilchaco," "Oughto."
Black-Lak—See Johnson & Son.
Blue Ribbon—See International Metal Polish Co.
Boston Blacking Co., (E. Cambridge), Cambridge, Mass. "Be-Be-Co."
Bradley & Vrooman Co., 2629 Dearborn St., Chicago, Ill.
Century—See Arnstein, Eugene.
Chandler, E. W., 917 Kishwaukee St., Rockford, Ill.
Chemical Spray Co., 74 Pearl St., Boston, Mass.
Chicago White Lead & Oil Co., 1454 S. Western Ave., Chicago, Ill. "King."
Columbus Varnish Co., Columbus, O. (See page 253.)
Cortland Specialty Co., 174-78 Railroad St., Cortland, N. Y. "Banner."
Cummer Products Co., 2150 W. 15th St., Cleveland, O. "Perfect Auto Gloss."
Detroit White Lead Works, 530-60 Milwaukee Ave., E., Detroit, Mich. "Rogers."
Dix Mfg. Co., Lewistown, Pa.
Durkee-Atwood Co., Minneapolis, Minn. "Rie-Nie."
E-Fec-Tiv—See Permatite Mfg. Co.
Eberson-Lindsley Paint Co., 1830-32 Morgan St., St. Louis, Mo. "Leather-Lac."
Effecto—See Pratt & Lambert.
Evernew—See Felton, Sibley & Co.
F-S.—See Felton, Sibley & Co.
Felton, Sibley & Co., 136-40 N. Fourth St., Philadelphia, Pa. "Evernew," "F-S."
Flexo—See Rodriguez, R. E.
Glazene—See New-Tone Mfg. Co.
Hall-Thompson Co., Hartford, Conn. "Wonder Worker," "Quad-Lac." (See page 739.)
Hauthaway & Sons, C. L., 346 Congress St., Boston, Mass.
Hippo—See Rodriguez, R. E.
Hollingshead Co., R. M., 112 N. Ninth St., Camden, N. J. "Whiz."

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PEERLESS

Automobile Specialties

Make old cars look like new

A different product for each part to make all used cars look as good as possible

Peerless Mohair Top Dressing

Waterproofs, dresses and dyes mohair, duck and canvas tops and curtains like new. Dries over night, leaving tops soft and pliable.

About one quart to dress a five-passenger car top.

Pint, 65c; Quart, $1.25

Peerless Leather Top Dressing

An oil dressing to renew the finish, and keep rubber, leather and pantasote tops and curtains soft and pliable. Dries over night. Not for seats or cushions.

About one quart to dress large five-passenger top and curtains.

Pint, 65c; Quart, $1.25

Peerless Ford Top Dressing

A dressing made for Ford top material, making a rich black gloss finish, adding life and color to old tops. Dries over night, wears indefinitely.

About one pint for a runabout top; one quart for a touring car top.

Pint, 65c; Quart, $1.25

Peerless Cushion Dressing

Without danger of washing or rubbing off. It brightens and renews the finish of leather seats and cushions. Dries in thirty minutes.

About one pint for small car and one quart for large car.

Pint, 65c; Quart, $1.25

Peerless Lamp Enamel—Gloss and Dull

A rich finish for brass, nickel or iron.

One coat covers solid over the metal or old enamel. Air drying over night.

Pint, 65c; Quart, $1.25

Peerless Cylinder Enamel—Black and Gray

A rich gloss enamel that saves cylinders and all metal engine parts from rusting. Not injured by heat, grease or gasoline. Air drying over night.

Pint, 65c; Quart, $1.25

Peerless Tire Paint

A white waterproof coating for tires containing nothing injurious to rubber and keeps tires looking bright and new.

One pint will cover five regular casings.

Pint, 54c; Quart, $1.04

Peerless Liquid Wax

A wax polish for all varnished surfaces of automobiles. In liquid form so that it is easily applied in a light even coat. Polished with ease and ready for use at once. Does not collect dust, and is not injured by water.

One pint will polish a large car.

Pint, 54c; Quart, $1.04

Peerless Auto Body Polish

A varnish food to brighten and renew the appearance of all varnished surfaces on an automobile. Applied and polished ready for use in a very few minutes.

About one pint will polish a car.

Pint, 54c; Quart, $1.04

Peerless Battery Box Black—Acid-Proof

An acid-proof coating for wood and metal that comes in contact with acid and fumes from batteries. Keeps acid from destroying wood and metal.

Pint, 54c; Quart, $1.04

Peerless Color Finishing Varnishes

The idea of an owner wanting to paint the body, wheels or chassis of his automobile his favorite color is now realized by the use of these products. The work can be done at home. The goods will cover solid with one coat and dry satisfactory over night. Very durable products. Made in eight colors.

	Straw Color	
	Medium Yellow	
Pint,	Red	**Quart,**
	Royal Auto Blue	
90c	Gray	**$1.60**
	Brewster Green	
	Black	
	White	

Peerless Black Japan—Extra Fine

A rich gloss air drying enamel for touch-up and all-around use on wood and metal parts of automobiles. One coat covers solid and dries over night.

Pint, 65c; Quart, $1.25

Peerless Fender Japan—Jet Black

Made especially for coating fenders and hoods with a rich black gloss enamel. Air dries and has a finish like a baked job. Dries in twenty-four to thirty-six hours.

About one quart to coat fenders of a small car.

Pint, 65c; Quart, $1.25

Peerless Mirroroid

A varnish renewer; to be applied to varnished surfaces that have lost their lustre and become dull through use. Dries over night with a fine lustre that will wear for months.

One pint to one quart to finish an automobile.

Pint, 65c; Quart, $1.25

Peerless Gasket Shellac

A strictly high grade shellac for gasket, cork carburetor floats, and such parts on an automobile. This is a high grade product cut in pure alcohol. Is not affected by gasoline.

½ Pt., 35c; 1 Pt., 65c; 1 Qt., $1.25

Peerless Lining Dye

A powerful black dye that dyes all cloth lining a black uniform color over stains and faded parts alike. Dries in two to three hours.

About one quart to dye inside of five-passenger car top.

Pint, 54c; Quart, $1.04

Peerless Rim Paint—Anti-Rust

A protective coating for automobile rims, to allow tires to be removed with ease and keep rims from rusting. Dries in four to five hours.

About one pint for rims of a small car.

Pint, 54c; Quart, $1.04

Used throughout the world by owners, garages and chauffeurs. Also used by over 8000 particular automobile painters.

DEALERS AND JOBBERS, NOTICE!

For your special convenience we have listed our complete line so that at all times you will have our catalogue before you with dealer, garage, hardware store, and paint shop discount of 33⅓% from list prices. Ask your jobber or write us for latest catalogue, also window display material and other selling helps.

Made and sold on a quality basis only by,

The Columbus Varnish Co.

Sole Makers Columbus, O., U.S.A.

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DRESSING, Leather (Continued)

International Metal Polish Co., Quill St. & Belt R. R., Indianapolis, Ind. "Blue Ribbon."
Jewell—See Wadsworth-Howland Co.
Jewell Mfg. Co., 2863 22d St., Chicago, Ill. "Nelsons."
Johnson & Son, S. C., 1012 16th St., Racine, Wis. "Black-Lak."
Johnston Paint Co., R. F., Pearl & Main Sts., Cincinnati, O. "Leather Lac," "Top Fix."
King—See Chicago White Lead & Oil Co.
Kneutop—See Western Reserve Varnish Co.
Lawrence & Co., W. W., Pittsburgh, Pa.
Leakanot—See National Rubber Co.
Leath-R-Nu—See Nu-Back Mfg. Co.
Leather-Lac—See Eberson-Lindsley Paint Co.
Leather Lac—See Johnston Paint Co.
Leather-Like—See Auto Products Mfg. Co.
Lucas & Co., John, 322-30 Race St., Philadelphia, Pa.
Mansfield Mfg. Corp., Syracuse, N. Y.
Martin, L. G., 3923 Forbes St., Pittsburgh, Pa.
Martin-Senour Co., 2510 Quarry St., Chicago, Ill.
Mat's—See Weiss Polish Works.
Mechem, J. L., 113 E. Jackson St., Centerville, Ia.
Miller Co., Frank, 349-51 W. 26th St., New York, N. Y.
Montgomery-Washburn Co., Saugerties, N. Y.
Mound City Paint & Color Co., 11th & Mullanphy Sts., St. Louis, Mo.
National Rubber Co., 4409 Piqua St., St. Louis, Mo. "Leakanot."
Nelsons—See Jewell Mfg. Co.
New-Tone Mfg. Co., 3336 Colorado Ave., Chicago, Ill. "Glazene."
Non-Gloss—See Auto Products Mfg. Co.
Northwestern Chemical Co., 610 State St., Marietta, O. "Norwesco." (See page 205.)
Norwesco—See Northwestern Chemical Co.
Nouveau—See Rodriguez, R. E.
Nu-Back Mfg. Co., 114 N. Commercial St., St. Louis, Mo. "Leath-R-Nu."
Nubian Paint & Varnish Co., 1856 Le Claire Ave., Chicago, Ill. "Victory."
Nutop—See Oriental Compound Co.
Oriental Compound Co., Ardmore, Pa. "Nutop."
Oughto—See Billings-Chapin Co.
Peerless—See Columbus Varnish Co.
Perfect Auto Gloss—See Cummer Products Co.
Permatex—See Benoit, Constant A.
Permatite Mfg. Co., 67 Fifth Ave., N. E., Minneapolis, Minn. "E-Fec-Tiv."
Pimbley Paint & Glass Co., St. Joseph, Mo. "Top-Newer."
Pioneer—See Northwestern Chemical Co.
Pratt & Lambert, 79 Tonawanda St., Buffalo, N. Y. "Effecto."
Quad-Lac—See Hall-Thompson Co.
Rex—See Armiger Chemical Co.
Rie-Nie—See Durkee-Atwood Co.
Rodriguez, R. E., 56-58 Warren St., New York, N. Y. "Nouveau," "Flexo," "Hippo."
Rogers—See Detroit White Lead Works.
Rub-R-Tite—See Auto Products Mfg. Co.
St. Louis Rubber Cement Co., 3046 Lambdin Ave., St. Louis, Mo.
Schlegel Mfg. Co., Oscar, 111 E. 12th St., New York, N. Y.
Slikup—See Arnold, N. B.
Special Products Co., 501 S. Jefferson St., Chicago, Ill.
Three-In-One Oil Co., 165 Broadway, New York, N. Y.
Thumb, E. W., 872 Orleans St., Chicago, Ill.
Top Fix—See Johnston Paint Co.
Top-Newer—See Pimbley Paint & Glass Co.
U-Sav-Your Mfg. Co., 51 Perkins St., Warren, Mass.
Uno Mfg. Co., Royal Ins. Bldg., Chicago, Ill.
Van Cleef Bros., 7709-11 Woodlawn Ave., Chicago, Ill.
Van Tilburg Oil Co., 2424-28 University Ave., S. E., Minneapolis, Minn. "Wang."
Victory—See Nubian Paint & Varnish Co.
Wadsworth-Howland Co., 225 N. Carpenter St., Chicago, Ill. "Jewell."
Wadsworth, Howland & Co., 141 Federal St., Boston, Mass. "Bay State."
Wang—See Van Tilburg Oil Co.
Weiss Polish Works, 216 S. Winchester Ave., Chicago, Ill. "Mat's."
Western Reserve Varnish Co., Cleveland, O. "Kneutop." (See page 733.)
West's Sons, L. M., 230 Broadway, Rockford, Ill.
Whiz—See Hollingshead Co.
Wonder Worker—See Hall-Thompson Co.
Zinsser & Co., W., 195 William St., New York, N. Y.

DRESSING MACHINES—See Machines, Top Bow Dressing

DRESSING, Mohair Top

(For cleaning and renovating mohair tops, slip covers or upholstery)

American Chemical & Mfg. Co., Arcade Bldg., Norfolk, Va. "Hippo."
Arnold, N. B., 1 Sigourney St., Brooklyn, N. Y. "Slikup."
Be-Be-Co.—See Boston Blacking Co.
Benoit, Constant A., Brooklyn, N. Y. "Permatex." (See page 169.)
Billings-Chapin Co., Cleveland, O.
Black-Lak—See Johnson & Son.
Boston Blacking Co. (E. Cambridge), Cambridge, Mass. "Be-Be-Co."
Buckeye—See Van Tilburg Oil Co.
Carr Co., F. S., 31 Beach St., Boston, Mass. "Success." (See page 189.)
Chandler, E. W., 917 Kishwaukee St., Rockford, Ill.
Columbus Varnish Co., Columbus, O. "Peerless." (See page 253.)
Durkee-Atwood Co., Minneapolis, Minn. "Rie-Nie."
Eberson-Lindsley Paint Co., 1830-32 Morgan St., St. Louis, Mo.
Effecto—See Pratt & Lambert.
Evernew—See Felton, Sibley & Co.
Felton, Sibley & Co., 136-40 N. Fourth St., Philadelphia, Pa. "Evernew."
Hall-Thompson Co., Hartford, Conn. "Wonder Worker" "Quad-Lac." (See page 739.)
Hippo—See American Chemical & Mfg. Co.
Johnson & Son, S. C., 1012 16th St., Racine, Wis. "Black-Lak."
Kneutop—See Western Reserve Varnish Co.
Leath-R-Nu—See Nu-Back Mfg. Co.
Lucas & Co., John, 322-30 Race St., Philadelphia, Pa.
Mansfield Mfg. Corp., Syracuse, N. Y.
Miller Co., Frank, 349-51 W. 26th St., New York, N. Y.
Noble Piano Co., 971 Woodward Ave., Detroit, Mich.

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9

Practical Auto Economies

Meritorious, inexpensive helps for repairing and refinishing shabby or damaged auto tops, upholstery, finish, fenders, wheels, radiators, etc.

Rub-R-Tite—elastic top refinisher and rewaterproofer.

Col-R-Ol—dyes for leather and the like.

Leather-Like—makes old leather look and wear like new.

Sta-Fix—finds and instantly mends radiator leaks.

Rub-R-Tite Patches—for top leaks, tears, etc.

No-Stitch-Cement—easy, permanent replacing of curtain lights.

Rub-On-Dye—cleans and dyes auto top-lining.

Stay-On Enamel—for lamps, fenders, metal parts.

RUB-ON VARNISH—quick drying, easily applied.

Dealers—Send for "Satisfaction or money back Plan" and Discounts.

AUTO PRODUCTS MFG. CO., Inc.
Buffalo, N. Y. Fort Erie, Ont., Can

WORLD STANDARD
REPAIR AND REFINISH
AUTOMOBILE ECONOMIES

The Grease Cup No One Dreads To Fill

NORECAP

(Non-Removable Cap)

QUICK! CLEAN! POSITIVE!

Manufactured by

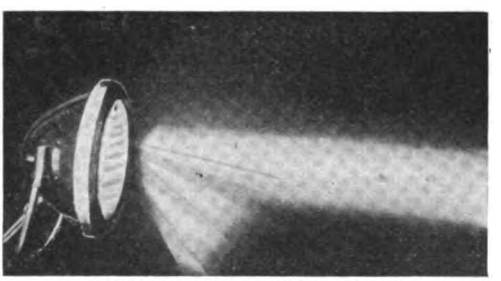
THE GREIST MFG. CO.
New Haven, Conn.

100% Profit to Dealers On This New Wonderful "DIRECT LIGHT" Lens

Dealers handling this lens have no competitor—why? Because the light is not diminished as in others. Notice illustration and you will see that the "road light" comes through "open veins," letting out the direct rays—thus the direct light is on the ground and the diffused light up and forward, which is non-glaring and gives a beautiful white light at a distance of 300 feet.

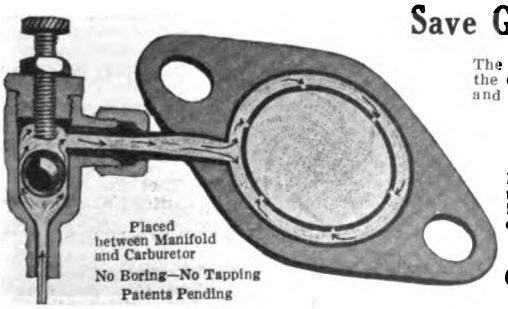
The Thuis Auto Headlight Deflector and Diffuser meets every ordinance requirement—unbreakable and one price for all sizes—$2 per set—price to dealer $1.05 per set.

Send your order in today. Be the first in your town to handle this "direct light" auto lens.



Actual Photograph of Thuis Dimmer

THE KOCH AUTO SUPPLY CO., 707 2nd Ave. S., Minneapolis, Minn.



Save Gasoline—Remove Carbon

The air is admitted in a swirling spray above the carburetor, producing a more perfect mixture and giving greater power.

C. M. C. Device

By attaching a rubber tube (with special nozzle) to device and admitting water, which is turned into steam, the carbon deposits are carried off through the exhaust.

Write for Booklet.

Carburetor Mantle Co., Inc.
1914 Broadway, N. Y. C.

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DRESSING, Mohair Top (Cont'd)

Northwestern Chemical Co., 610 State St., Marietta, O. "Norwesco." (See page 205.)

Norwesco—See Northwestern Chemical Co.

Nu-Back Mfg. Co., 114 N. Commercial St., St. Louis, Mo. "Leath-R-Nu."

Nutop—See Oriental Compound Co.

Oriental Compound Co., Ardmore, Pa. "Nutop."

Peerless—See Columbus Varnish Co.

Perfectite—See Price Fire & Water Proofing Co.

Permatex—See Benoit, Constant A.

Pimbley Paint & Glass Co., St. Joseph, Mo. "Top-Newer."

Pratt & Lambert, 79 Tonawanda St., Buffalo, N. Y. "Effecto."

Price Fire & Water Proofing Co., 42 Union St., Poughkeepsie, N. Y. "Perfectite."

Quad-Lac—See Hall-Thompson Co.

Rie-Nie—See Durkee-Atwood Co.

Slikup—See Arnold, N. B.

Success—See Carr Co.

Suto—See Sutorius Auto Top Co.

Sutorius Auto Top Co., 621-23 Third Ave., S. Minneapolis, Minn. "Suto."

Top-Newer—See Pimbley Paint & Glass Co.

Van Tilburg Oil Co., 2424-28 University Ave., S. E., Minneapolis, Minn. "Wang," "Buckeye."

Wang—See Van Tilburg Oil Co.

West's Sons, L. M., 230 Broadway, Rockford, Ill.

Western Reserve Varnish Co., Cleveland, O. "Kneutop." (See page 733.)

Wonder Worker—See Hall-Thompson Co.

DRESSING, TOP—See Dressing, Leather; also Dressing, Mohair

DRESSING, UPHOLSTERY—See Dressing, Leather

DRIFT INDICATORS, AEROPLANE—See Indicators, Aeroplane Drift

DRIFT PINS—See Punches, Center, Prick and Drift

DRIFT PUNCHES—See Punches, Center, Prick and Drift

DRILL CHUCKS—See Chucks, Drill

DRILL, ENAMELED—See Cloth, Enameled

DRILL GAGES—See Gages, Drill

DRILL GRINDERS—See Grinders, Drill

DRILLING COMPOUNDS—See Lubricants, Cutting

DRILLS, Breast

Frey Co., John S., 936 Crescent Ave., Bridgeport, Conn.

Goodell-Pratt Co., Greenfield, Mass. (See page 751.)

Malleable Iron Fittings Co., Branford, Conn. "Mifco."

Mifco—See Malleable Iron Fittings Co.

Millers Falls Co., Millers Falls, Mass.

North Bros. Mfg. Co., Lehigh & American Aves., Philadelphia, Pa. "Yankee."

Peck, Stow & Wilcox Co., Southington, Conn. "Pexto."

Pexto—See Peck, Stow & Wilcox Co.

Turner & Deegan, Bristol, Conn.

Yankee—See North Bros. Mfg. Co.

DRILLS, Centering

Cleveland Twist Drill Co., E. 49th St. & Lakeside Ave., Cleveland, O.

Slocomb Co., J. T., 85 Oxford St., Providence, R. I.

DRILLS, GRINDERS and POLISHERS, Electric Portable

American Electric Tool Co., West Newton, Mass.

Black & Decker Mfg. Co., 119 Hollingsworth St., Baltimore, Md. (See page 323.)

Chicago Pneumatic Tool Co., 1039 Fisher Bldg., Chicago, Ill. "Little Giant." (See page 259.)

Cincinnati Electrical Tool Co., 650-52 Evans St., Cincinnati, O.

Clark, Jr., Electric Co., James, 520 W. Main St., Louisville, Ky. "Willey."

Coates Clipper Mfg. Co., 237 Chandler St., Worcester, Mass.

Crane, H. G., Brookline, Mass.

Deer Co., A. J., Hornell, N. Y. "Royal."

Dumore—See Wisconsin Electric Co.

Gem Mfg. Co., Goebel & Fulton Sts., Pittsburgh, Pa.

Gilfillian Bros. Smelting & Refining Co., 217 W. Sixth St., Los Angeles, Cal.

Hisey-Wolf Machine Co., Cincinnati, O.

Ideal—See Neil & Smith Electric Tool Co.

Little Giant—See Chicago Pneumatic Tool Co.

Neil & Smith Electric Tool Co., 120 S. Sixth St., Cincinnati, O. "Ideal."

Racine Electric Co., Racine, Wis.

Royal—See Deer Co.

Standard Electric Tool Co., 128 Opera Pl., Cincinnati, O.

Stow Flexible Shaft Co., 26th & Callowhill Sts., Philadelphia, Pa.

Stow Mfg. Co., Binghamton, N. Y.

Temco Electric Motor Co., Leipsic, O.

United States Electrical Tool Co., Cincinnati, O. (See page 257.)

Van Dorn Electric Tool Co., Cleveland, O.

Webb Mfg. Co., ft. Center St., Newark, N. J. (See page 715.)

Willey—See Clark, Jr., Electric Co.

Williams & Ackerman, 95 Liberty St., New York, N. Y. (Metropolitan Distributors for Black & Decker Drills.) (See page 743.)

Wisconsin Electric Co., 5704 Sixteenth St., Racine, Wis. "Dumore." (See page 795.)

DRILLING MACHINES, Multiple Spindle

Baush Machine Tool Co., 156 Wason Ave., Springfield, Mass.

Foote-Burt Co., 4101 St. Clair Ave., Cleveland, O.

Fox Machine Co., 1811 W. Ganson St., Jackson, Mich.

Hole Hog—See Moline Tool Co.

Langelier Mfg. Co., 67 Clifford St., Providence, R. I.

Moline Tool Co., 819 20th St., Moline, Ill. "Hole Hog."

Natco—See National Automatic Tool Co.

National Automatic Tool Co., S. Seventh & N Sts., Richmond, Ind. "Natco."

Pratt & Whitney Co., 111 Broadway, New York, N. Y. (See page 73.)

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¼" drill, weight 9 pounds.

½" drill. weight 14 pounds.

½" drill in steel, weight 24 pounds.

Made in three sizes, one-horse, two and three-horse.

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O grinder, for grinding castings.

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Works, Cincinnati, Ohio.

The United States Electrical Tool Co.

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DRILLING MACHINES, Radial

American Tool Works Co., Sixth & Eggleston Sts., Cincinnati, O.
Baush Machine Tool Co., 156 Wason Ave., Springfield, Mass.
Carlton Machine Tool Co., 1543 Queen City Ave., Cincinnati, O.
Cincinnati-Bickford Tool Co., (Oakley) Cincinnati, O.
Dreses Machine Tool Co., 227-39 W. Micken Ave., Cincinnati. O.
Fosdick Machine Tool Co., Blue Rock & Apple Sts., Cincinnati, O.
Hilbert Machine Co., 2116-22 Colerain Ave., Cincinnati, O.
Morris Machine Tool Co., John B., 930 Vogt St., Cincinnati, O.
Mueller Machine Tool Co., 2425-29 Colerain Ave., Cincinnati, O.
Niles-Bement-Pond Co., 111 Broadway, New York, N. Y.
Reed-Prentice Co., Duncan Ave., Worcester, Mass.
Taylor & Fenn Co., 54-70 Arch St., Hartford, Conn.
Western Machine Tool Works, Holland, Mich.

DRILLS, Ratchet

Armstrong Bros. Tool Co., 304 N. Francisco Ave., Chicago, Ill. (See page 773.)
Atha Tool Co., Chapel St., Newark, N. J.
Billings & Spencer Co., Laurel & Park Sts., Hartford, Conn. "Packer."
Braunsdorf-Mueller Co., 205 Madison St., Elizabeth, N. J.
Diamond—See Whitman & Barnes Mfg. Co.
Goodell-Pratt Co., Greenfield, Mass. (See page 751.)
Hunter Machine Co., Jas., 16 Main St., North Adams, Mass.
Keystone Mfg. Co., 41 Chandler St., Buffalo, N. Y. "Monarch," "Weston."
Lowell Wrench Co., 54 Commercial St., Worcester, Mass.
Millers Falls Co., Millers Falls, Mass.
Monarch—See Keystone Mfg. Co.
Ohlen & Sons Saw Mfg. Co., James, West End Buttles Ave., Columbus, O.
Oswego Tool Co., 119-27 W. First St., Oswego, N. Y. "Packer."
Packer—See Billings & Spencer Co.
Packer—See Oswego Tool Co.
Parker Co., Charles, 48 Elm St., Meriden, Conn.
Peck, Stow & Wilcox Co., Southington, Conn. "Pexto."
Pexto—See Peck, Stow & Wilcox Co.
Pratt & Whitney Co., 111 Broadway, New York, N. Y. "Renshaw." (See page 73.)
Renshaw—See Pratt & Whitney Co.
Weston—See Keystone Mfg. Co.
Whitman & Barnes Mfg. Co., E. Exchange St., Akron, O. "Diamond."

DRILLING MACHINES, Sensitive

Avey—See Cincinnati Pulley Machinery Co.
Burke Machine Tool Co., Conneaut, O.
Cincinnati Pulley Machinery Co., Second & Race Sts., Cincinnati, O. "Avey."
Conover-Overkamp Machine & Tool Co., 841 W. Germantown St., Dayton, O.
Corbin-Church Co., New Britain, Conn.
Economy—See Rockford Lathe & Drill Co.
Fox Machine Co., 1811 W. Gauson St., Jackson, Mich.
Henry & Wright Mfg. Co., Hartford, Conn.
Hoysradt & Case, 131 Cornell St., Kingston, N. Y.
Kern Machine Tool Co., Hamilton, O.
Langelier Mfg. Co., 67 Clifford St., Providence, R. I.
Leland-Gifford Co., 1025 Southbridge St., Worcester, Mass.
Myers Machine Tool Co., Second & Chestnut Sts., Columbia, Pa.
North Wales Machine Co., Center & Elm Aves., North Wales, Pa.
Pratt & Whitney Co., 111 Broadway, New York, N. Y. (See page 73.)
Reed Co., Francis, 43 Hammond St., Worcester, Mass.
Reed-Prentice Co., Duncan Ave., Worcester, Mass.
Rockford Lathe & Drill Co., 1827 14th Ave., Rockford, Ill. "Economy."
Rockwell—See Ryerson & Son.
Ryerson & Son, Joseph T., 2558 W. 16th St., Chicago, Ill. "Rockwell."
Sipp Machine Co., Keen & Warren Sts., Paterson, N. J.
Sloan & Chace Mfg. Co., Sixth Ave. & 13th St., Newark, N. J.
Stapf & Co., John B., Dunkirk, N. Y.
Taylor & Fenn Co., 54-70 Arch St., Hartford, Conn.
Washburn Shops, Boynton St., Worcester, Mass.

DRILLS, TAPPING—See Drills, Upright

DRILLING MACHINES, Turret

Quint, A. D., 8 Clinton St., Hartford, Conn.
Turner Machine Co., 26-32 Maple Ave., Danbury, Conn.

DRILLS, Twist

American Twist Drill Co., W. Jefferson Ave. & 21st St., Detroit, Mich.
Buckeye Twist Drill Co., Elm St., Alliance, O.
Cleveland Twist Drill Co., E. 49th St. & Lakeside Ave., Cleveland, O. "Paragon."
Detroit Twist Drill Co., Detroit, Mich. (See page 259.)
Diamond—See Whitman & Barnes Mfg. Co.
Duff, William E., York, Pa. (Dealer.) (See page 457.)
Lincoln-Williams Twist Drill Co., Taunton, Mass.
Morse Twist Drill & Machine Co., New Bedford, Mass.
National Twist Drill & Tool Co., Brush St., nr. E. Grand Blvd., Detroit, Mich.
New Process Twist Drill Co., Taunton, Mass.
Norka—See Whitman & Barnes Mfg. Co.
Paragon—See Cleveland Twist Drill Co.
Pratt & Whitney Co., 111 Broadway, New York, N. Y. (See page 73.)
Reliance Steel & Tool Co., 54-56 Dey St., New York, N. Y. (Dealers.) (See page 275.)
Rich Steel Products Co., Battle Creek, Mich.
Rich Tool Co., Railway Exchange, Chicago, Ill.
Standard Tool Co., 6900-34 Central Ave., Cleveland, O.
Syracuse Twist Drill Co., 936 Grape St., Syracuse, N. Y.
Union Twist Drill Co., Chestnut Hill Ave., Athol, Mass.
Whitman & Barnes Mfg. Co., E. Exchange St., Akron, O. "Norka," "Diamond."

DRILLING MACHINES, Upright

Aurora Tool Works, Aurora, Ind.
Baker Bros., Westlake Ave. & Post St., Toledo, O.

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DRILLING MACHINES, Upright (Continued)

Barnes Co., W. F. & John, 301 S. Water St., Rockford, Ill.

Barnes Drill Co., 814-30 Chestnut St., Rockford, Ill.

Cincinnati-Bickford Tool Co., (Oakley) Cincinnati, O.

Colburn Machine Tool Co., Franklin, Pa.

Davis Machine Tool Co., 305 St. Paul St., Rochester, N. Y.

Economy—See Rockford Lathe & Drill Co.

Frontier Iron Works, 41 Letchworth St., Buffalo, N. Y.

Hilbert Machine Co., 2116-22 Colerain Ave., Cincinnati, O.

Hoefer Mfg. Co., Chicago & Jackson Sts., Freeport, Ill.

Kern Machine Tool Co., Hamilton, O.

Kokomo—See Superior Machine Tool Co.

Niles-Bement-Pond Co., 111 Broadway, New York, N. Y.

Reed-Prentice Co., Duncan Ave., Worcester, Mass.

Rockford Drilling Machine Co., ft. Catherine St., Rockford, Ill.

Rockford Lathe & Drill Co., Rockford, Ill. "Economy."

Rockford Machine Tool Co., Rockford, Ill.

Sibley Machine Co., 204-32 E. Tutt St., South Bend, Ind.

Snyder & Son, J. E., Dewey & Parker Sts., Worcester, Mass.

Superior Machine Tool Co., E. Differbaugh St., Kokomo, Ind. "Kokomo."

Taylor & Fenn, 54-70 Arch St., Hartford, Conn.

Tschudi-McBarron Machine Co., Dayton, O.

DRIP COCKS—See Cocks

DRIP PANS—See Pans, Drip

DRIVE GEAR BEARINGS FOR FORDS—See Bearings, Drive Gear Ball Thrust

DRIVE SHAFT STEADY BEARINGS—See Bearings, Drive Shaft Steady

DRIVE SHAFTS—See Shafts, Propeller

DRIVERS, Screw

American Forge & Machine Co., 1425 Barth Ct., Canton, O.

Auto Forge Sales Co., Columbus, O.

Billings & Spencer Co., Laurel & Park Sts., Hartford, Conn.

Braunsdorf-Mueller Co., 205 Madison St., Elizabeth, N. J. "New Century," "O. K.," "Ideal."

Bridgeport Hardware Mfg. Corp., 461 Iranistan Ave., Bridgeport, Conn. "Warwick," "Hercules," "Lead-All," "Matchless," "Reliance," "Vulcan."

Buffum Tool Co., Louisiana, Mo. (See page 707.)

Cassady-Fairbank Mfg. Co., 6106-30 La Salle St., Chicago, Ill.

Champion—See Union Hardware Co.

Chapin-Stephens Co., Pine Meadow, Conn.

Cincinnati Tool Co., 1951 Waverly Ave., Norwood, O. "Hargrave."

Crescent Tool Co., 204 Harrison St., Jamestown, N. Y. "Hamr-Handl."

Cronk & Carrier Mfg. Co., Second National Bank Bldg., Elmira, N. Y. "Elmira," "Star."

Dikeman Mfg. Co., Merwin St., Norwalk, Conn.

Disston Sons, Henry, (Tacony) Philadelphia, Pa.

Edelmann & Co., E., 341-63 E. Ohio St., Chicago, Ill.

Elmira—See Cronk & Carrier Mfg. Co.

Gay, Geo. E., Augusta, Me.

Giant—See Tuck Mfg. Co.

Goodell-Pratt Co., Greenfield, Mass. (See page 751.)

Hamr-Handl—See Crescent Tool Co.

Hargrave—See Cincinnati Tool Co.

Herbrand Co., Fremont, O.

Hercules—See Tuck Mfg. Co.

Hercules—See Bridgeport Hardware Mfg. Corp.

Hurwood—See Stanley Rule & Level Co.

Ideal—See Braunsdorf-Mueller Co.

Ives Mfg. Co., W. A., Wallingford, Conn. "Mephisto."

Lead-All—See Bridgeport Hardware Mfg. Corp.

Linway Co., Chamber of Commerce Bldg., Chicago, Ill. "Pushanpull."

Lipscomb—See Ellis Co.

M-B Tool Co., Danielson, Conn.

Marble Arms & Mfg. Co., 267 Delta Ave., Gladstone, Mich.

Marcy Tool Works, Putnam, Conn.

Matchless—See Bridgeport Hardware Mfg. Corp.

Mayhew Co., H. H., Shelburne Falls, Mass. "Monarch," "Peerless."

Mephisto—See Ives Mfg. Co.

Monarch—See Mayhew Co.

Mound Tool Co., Dept. D, Seventh & Hickory Sts., St. Louis, Mo.. (See page 789.)

Never Break—See S. & I. Co.

New Century—See Braunsdorf-Mueller Co.

North Bros. Mfg. Co., Lehigh & American Aves., Philadelphia, Pa. "Yankee."

O. K.—See Braunsdorf-Mueller Co.

Ohio Tool Co., Charleston, W. Va.

Peerless—See Mayhew Co.

Perfect Handle—See Smith & Co.

Pushanpull—See Linway Co.

Red Devil—See Smith & Hemenway.

Reliable—See S. & I. Co.

Reliance—See Bridgeport Hardware Mfg. Corp.

Rival—See S. & I. Co.

S. & I. Co., 55-57 Governor St., Springfield, Mass. "Never Break," "Reliable," "Rival."

Smith & Co., H. D., Plantsville, Conn. "Perfect Handle."

Smith & Hemenway, 130 Colt St., Irvington, N. J. "Red Devil."

Snell Mfg. Co., Fiskdale, Mass.

Stanley Rule & Level Co., 111 Elm St., New Britain, Conn. "Hurwood."

Star—See Cronk & Carrier Mfg. Co.

Starrett Co., L. S., Athol, Mass.

Stortz & Son, John, 210-12 Vine St., Philadelphia, Pa.

Swan Co., Jas., Seymour, Conn.

Tuck Mfg. Co., 74 Ames St., Brockton, Mass. "Hercules," "Giant."

Turner & Deegan, Bristol, Conn.

Union Hardware Co., Torrington, Conn. "Champion," "Valley."

Valley—See Union Hardware Co.

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DRIVERS, Screw (Continued)

Vichek Tool Co., 10709 Quincy Ave., Cleveland, O.
Vulcan—See Bridgeport Hardware Mfg. Corp.
Warwick—See Bridgeport Hardware Mfg. Corp.
Whitaker Mfg. Co., 409 S. Green St., Chicago, Ill.
Yankee—See North Bros. Mfg. Co.

DRIVING CHAIN—See Chain, Transmission; also Chain, Motorcycle Driving

DRIVING GEARS FOR FORDS—See Gears, Special Ratio

DRIVEWAY GATES—See Gates, Automatic

DROP FORGED WRENCHES—See Wrenches, Nut and Bolt

DROP FORGINGS—See Forgings, Drop

DROP HAMMERS—See Hammers, Power

DRUMS, Pressed Steel Brake

(See also Stampings, Metal; for Cast Drums—See Castings)

American Pulley Co., 4200 Wissahickon Ave., Philadelphia, Pa.
Bossert Corp., Utica, N. Y. (See page 363.)
Crosby Co., Buffalo, N. Y. (See page 669.)
Federal Pressed Steel Co., Keefe Ave. & N. Pierce St., Milwaukee, Wis.
Gier Pressed Steel Co., Lansing, Mich. (See page 505.)
Hydraulic Pressed Steel Co., 3180 E. 61st St., Cleveland, O. (See page 297.)
Ireland & Matthews Mfg. Co., Beard & Chatfield Sts., Detroit, Mich.
Kelsey Wheel Co., Detroit, Mich. (See page 355.)
Konigslow Mfg. Co., Otto E., 3701 Perkins Ave., Cleveland, O.
Pressed Steel Tank Co., Greenfield Ave., West Allis, Wis.
Savage Arms Corp., Sharon, Pa. (See page 213.)
Worcester Pressed Steel Co., Worcester, Mass.

DRY BATTERIES—See Batteries, Dry

DRYING ROOMS—See Rooms, Paint

DUCK, ENAMELED—See Cloth, Enameled

DUMMY EXTENSIONS FOR FORDS—See Extensions, Dummy Frame

DUMMY RADIATORS FOR FORDS—See Hoods, Radiator

DUMPING BODIES—See Bodies, Special Dumping

DUST PANS—See Pans, Dust

DUST RINGS—See Washers, Felt

DUSTERS, MOTORISTS'—See Clothing, Motorists'

DYE, Top Lining

(For restoring or changing the color of top linings)

Arnold, N. B., 1 Sigourney St., Brooklyn, N. Y. "Silkup."
Auto Products Mfg. Co., Buffalo, N. Y. "Col-R-Ol," "Rub-on." (See page 255.)
Autonamel Co., 94-97 St. Paul St., Rochester, N. Y.
Be-Be-Co.—See Boston Blacking Co.
Boston Blacking Co. (E. Cambridge), Cambridge, Mass. "Be-Be-Co."
Col-R-Ol—See Auto Products Mfg. Co.
Columbus Varnish Co., Columbus, O. (See page 253.)
Durkee-Atwood Co., Minneapolis, Minn. "Rie-Nie."
Hall-Thompson Co., Hartford, Conn. "Wonder Worker." (See page 739.)
Hollingshead Co., R. M., 112 N. Ninth St., Camden, N. J. "Whiz."
Mansfield Mfg. Corp., Syracuse, N. Y.
Northwestern Chemical Co., 610 State St., Marietta, O. "Norwesco." (See page 205.)
Norwesco—See Northwestern Chemical Co.
Nu-Back Mfg. Co., 114 N. Commercial St., St. Louis, Mo.
Nu-Stain—See Atlas Auto Supply Co.
Rie-Nie—See Durkee-Atwood Co.
Rub-on—See Auto Products Mfg. Co.
Silkup—See Arnold, N. B.
Whiz—See Hollingshead Co.
Wonder Worker—See Hall-Thompson Co.

DYNAMOMETERS, Electric Testing

(For testing the power of gasoline motors; see also Dynamometers, Hydraulic)

Alden, Geo. I., 48 Queen St., Worcester, Mass.
Diehl Mfg. Co., Elizabethport, N. J.
Sprague Electric Works, 527 W. 34th St., New York, N. Y.

DYNAMOMETERS, Hydraulic Testing

(For testing the power of gasoline motors; see also Dynamometers, Electric)

Burr Co., Champaign, Ill.
Detroit—See Michigan Motor Specialties Co
Herschell-Spillman Co., North Tonawanda, N. Y. (See page 287.)
Michigan Motor Specialties Co., 26-40 Dubois St., Detroit, Mich. "Detroit."
Standard Motor Construction Co., 172-80 Whiton St., Jersey City, N. J.

DYNAMOS, BATTERY CHARGING—See Dynamos, Electric Lighting; also Dynamos and Motor Generators; also Systems, Electric Lighting

DYNAMOS and MOTOR GENERATORS, Battery Charging

(For Garages and Battery Charging Plants)

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Andrae & Sons Co., Julius, Broadway & Michigan Sts., Milwaukee, Wis.
Cushman Electric Co., Concord, N. H.
Diehl Mfg. Co., Elizabethport, N. J.
Electric Products Co., Cleveland, O.
Ellington Electric Co., 128 S. Fourth St., Quincy, Ill.
Fairbanks, Morse & Co., 900 S. Wabash Ave., Chicago, Ill.
H-B—See Hobart Bros. Co.
Hobart Bros. Co., 113 Water St., Troy, O "H-B."
Holtzer-Cabot Electric Co., Roxbury, Mass.

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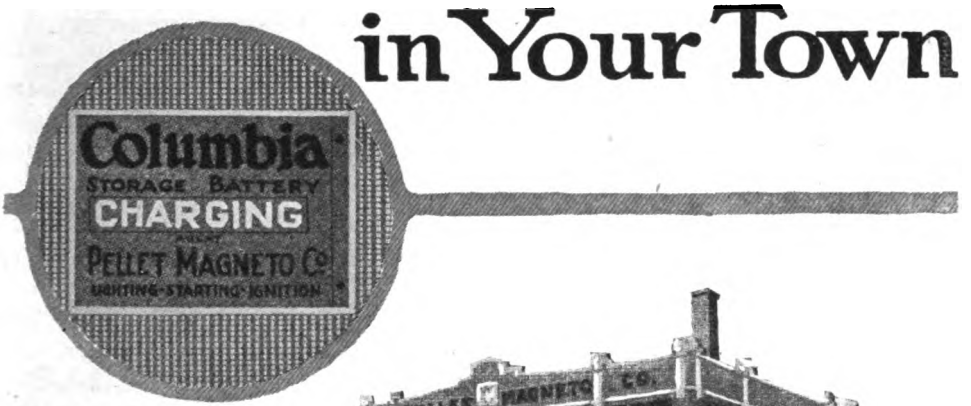

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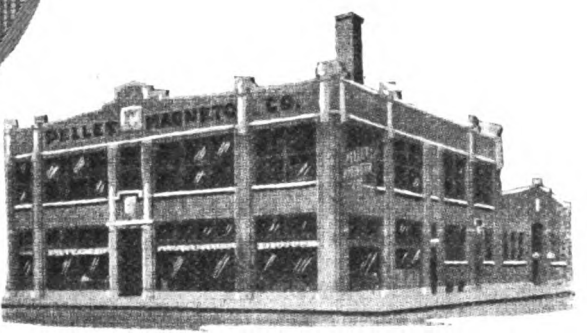
over your garage door means dollars to you and expert electrical service to the car owners in your vicinity—backed by our co-operation and all the resources of our large organization. Car owners recognize this sign.



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—how to make your garage "the electrical service station in your town" and what it will cost you.

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The advantage of this proposition is that so few garages are in a position to give this important service that you will have no competition for miles around.

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DYNAMOS and MOTOR GENERATORS, Battery Charging (Continued)

Kendrick & Davis Co., Lebanon, N. H.
Kewanee Private Utilities Co., Kewanee, Ill.
Langstadt-Meyer Co., 767 College Ave., Appleton, Wis.
Lincoln Electric Co., 38th St. & Kelly Ave., N. E., Cleveland, O.
Main Electric Mfg. Co., 500-20 Aiken Ave., Pittsburgh, Pa.
Martin—See Northwestern Electric Co.
Northwestern Electric Co., 611-15 W. Adams St., Chicago, Ill. "Martin."
Price Electric Devices Corp., Waynesboro, Va.
Robbins & Myers Co., Springfield, O. (See page 269.)
St. Louis Electrical Works, 4057 Forest Park Blvd., St. Louis, Mo. (See page 269.)
Sprague Electric Works, 527 W. 34th St., New York, N. Y.
Western Electric Co., 195 Broadway, New York, N. Y.
Westinghouse Electric & Mfg. Co., 110-14 W. 42nd St., New York, N. Y. (See page 667.)

DYNAMOS, Electric Lighting and Battery Charging

(Electric lighting generators: see also Starters, Electric; also Systems, Electric Lighting)

American Ever Ready Works, Long Island City, N. Y.
Auto-Liter—See Electric Auto-Lite Corp.
Auto-Sparker—See Motsinger Device Mfg. Co.
Bijur Motor Lighting Co., 15th St. & River Front, Hoboken, N. J.
Carleton Co., 170 Summer St., Boston, Mass.
Dayton Electrical Mfg. Co., U. S. Bldg., Dayton, O.
Dayton Engineering Laboratories Co., 329 E. First St., Dayton, O. "Delco."
Delco—See Dayton Engineering Laboratories Co.
Dyneto Electric Corp., Syracuse, N. Y. (See page 269.)
Electric Auto-Lite Corp, Toledo, O. "Auto-Liter." (See pages 647 to 650.)
Federal Devices Co., 1356 Michigan Ave., Chicago, Ill.
Fisher Electrical Works, 1 Lynn St., Detroit, Mich. (See page 269.)
Gray & Davis, Boston, Mass. (See page 651.)
Heinze Co., John O., Springfield, O. (See page 653.)
Henricks Magneto & Electric Co., 1200 St. Paul St., Indianapolis, Ind.
Hertner Electric & Mfg. Co., 1905 W. 112th St., Cleveland, O.
Holtzer-Cabot Electric Co., Roxbury, Mass.
Huff—See Simms Magneto Co.
Ita Manufacturers, Glen Ellyn, Ill. (See page 495.)
Kemco Electric Mfg. Co., Salem, O.
L-N—See Leece-Neville Co.
Lauraine Magneto Co., 1765 Broadway, New York, N. Y. (See page 447.)
Leece-Neville Co., 5363 Hamilton Ave., Cleveland, O. "L-N."
Leonard Electric Co., Ward, Mt. Vernon, N. Y.
Menominee—See Tideman Electric Mfg. Co.
Midco—See Teagle Co.
Motsinger Device Mfg. Co., Lafayette, Ind. "Auto-Sparker."
North East Electric Co., Rochester, N. Y. (See pages 265 to 268.)
Remy Electric Co., 1623 E. Grand Blvd., Detroit, Mich.
Simms Magneto Co., 277 N. Arlington Ave., East Orange, N. J. "Huff."
Teagle Co., 1125 Oregon Ave., Cleveland, O. "Midco."
Teco—See Titan Engineering Co.
Tideman Electric Mfg. Co., Menominee, Mich. "Menominee."
Titan Engineering Co., Union City, Ind. "Teco."
Verlux Co., Alliance, O.
Vesta Accumulator Co., 2100 Indiana Ave., Chicago, Ill.
Wagner Electric Mfg. Co., 6400 Plymouth Ave., St. Louis, Mo.
Wells Mfg. Co., R. C., Fond du Lac, Wis.
Westinghouse Electric & Mfg. Co., 110-14 W. 42d St., New York, N. Y. (See page 667.)

DYNAMOS, Electric Lighting and Battery Charging, for Fords

(Lighting Generators—See also Starters, Electric)

Carleton Co., 170 Summer St., Boston, Mass.
Dayton Electrical Mfg. Co., U. S. Bldg., Dayton, O.
Detroit Starter Co., 30-32 E. Larned St., Detroit, Mich. "Genolite."
Dyneto Electric Corp., Syracuse, N. Y. (See page 269.)
Fisher Electrical Works, 1 Lynn St., Detroit, Mich. (See page 269.)
Genemotor—See Picard & Co.
Genolite—See Detroit Starter Co.
Gray & Davis, Boston, Mass. (See page 651.)
Hendricks Magneto & Electric Co., 1200 St. Paul St., Indianapolis, Ind.
Holtzer-Cabot Electric Co., Roxbury, Mass. "J-S."
Ita Manufacturers, Glen Ellyn, Ill. (See page 495.)
J-S—See Holtzer-Cabot Electric Co.
Jackson Co., Chas. A., 222 Elliott St., Boston, Mass.
Kemco Electric Mfg. Co., Salem, O.
Menominee—See Tideman Electric Mfg. Co.
National Electric Lighting Co., Wilton Junction, Ia.
Pellet Magneto Co., 25th St. & Wabash Ave., Chicago, Ill. (See page 263.)
Picard & Co., A. J., 9 W. 61st St., New York, N. Y. "Genemotor." (See page 273.)
Teco—See Titan Engineering Co.
Tideman Electric Mfg. Co., Menominee, Mich. "Menominee."
Titan Engineering Co., Union City, Ind. "Teco."
Wells Mfg. Co., R. C., Fond du Lac, Wis.
Westinghouse Electric & Mfg. Co., 110-14 W. 42nd St., New York, N. Y. (See page 667.)

DYNAMOS, IGNITION—See Magnetos, Ignition

DYNAMOS, Motor Boat Electric Lighting

Leece-Neville Co., 5363 Hamilton Ave., Cleveland, O.

DYNAMOS, Motorcycle Electric Lighting

Leece-Neville Co., 5363 Hamilton Ave., Cleveland, O.
Remy Electric Co., 1623 E. Grand Blvd., Detroit, Mich.

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North East Electric Company

Manufacturers of Starting, Lighting and Ignition Apparatus for Automotive Vehicles

Executive Offices and Factory

Rochester, N. Y.

BRANCHES

Owned and operated by North East Elec. Co.

CHICAGO, Ill.	2701 S. Wabash Ave.
DETROIT, Mich.	805 Woodward Ave.
KANSAS CITY, Mo.	1819 McGee Street
NEW YORK CITY	125 West 51st Street
SAN FRANCISCO, Cal.	1034 Geary Street
ATLANTA, Ga.	55 West Peachtree Street
WINDSOR, Ont., Can.	83 Pierre Avenue
LONDON, Eng.	45 Poland St., London, W. United Motor Industries Ltd.

NORTH EAST SERVICE STATIONS

ALABAMA

Birmingham:	Brownell Auto Co., Inc., Avenue D and 20 Street
Dothan:	Bristow Allen & Co., N. St. Andrews Street
Mobile:	Mobile Elec. Garage, 210 Royal Street
Montgomery:	Hobbie Motor Car Co.
Selma:	Hooper Motor Co.

ARIZONA

Globe:	Western Machinery Co.
Nogales:	Western Machinery Co.
Phoenix:	Western Machinery Co.
Tucson:	Western Machinery Co.

ARKANSAS

Little Rock:	S. R. Thomas Auto Co., 400 Center Street

CALIFORNIA

Bakersfield:	Bakersfield Garage & Auto Supply Co.
El Centro:	C. E. Coggins, 409 Main Street
Fresno:	Cobb-Evans Automobile Co., 1228 K Street
Hanford:	Phil. Shellabarger Elec. Service Station, 214 N. Irwin St.
Lindsay:	Central California Electric Co.
Los Angeles:	Electric Equipment Co., 1240 S. Hope Street
Modesto:	McDuffie & MacBride, Inc.
Oakland:	Schelbner & Hodson, 2324 Broadway
Pasadena:	Western Auto Electric Corporation
Redlands:	Stutt Bros., cor Cajon Street and Citrus Avenue
Sacramento:	Miller Automobile Co., 1615 M Street
San Bernardino:	Auto Elec. Co., 323 G Street
San Diego:	J. Stanley La Sha, 1251-57 Fourth Street
San Francisco:	North East Electric Co., 1034 Geary Street
San Jose	Osen-McFarland Auto Co., 202 N. 1st Street
Stockton:	E. Allen Test, 112-14 E. Miner Avenue

COLORADO

Colorado Springs:	Marksheffel Motor Co., 22 N. Cascade Avenue
Denver:	Tom Botterill, 1272-78 Broadway
Montrose:	Hartman Bros., 521 Main Street
Pueblo:	The Pueblo Automobile Co., 4th and Court Streets
Rifle:	C. M. Donell
Trinidad:	Trinidad Garage Co., 125-130 Maple Street

CONNECTICUT

Bridgeport:	Blue Ribbon Garage, 283 Fairfield Avenue
Hartford:	Robert Ashwell, 341 Trumbull Street
New London:	Garlock & Haynes Co., 108 Main Street

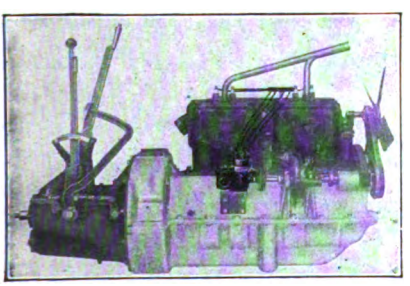
DISTRICT OF COLUMBIA

Washington:	Miller-Dudley Co., 1625 Fourteenth Street, N. W.
Washington:	Semmes Motor Co., Inc., 613 G Street, N. W.

FLORIDA

Miami:	L. A. Jones Garage cor. Avenue E and 11th Street
Pensacola:	G. H. Hayes, 17 Palafox Street
Orlando:	I. W. Phillips & Sons
Tampa:	Ferman Motor Car Co., 407-9 Jackson Street

North East Model "S" Ignition Distributor



Application of North East Model "S" Ignition Distributor

STARTING **LIGHTING** **IGNITION**

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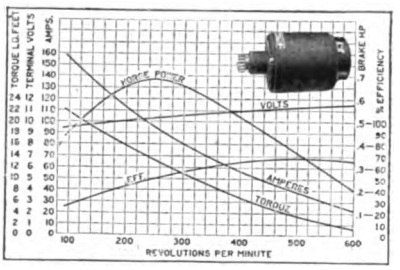
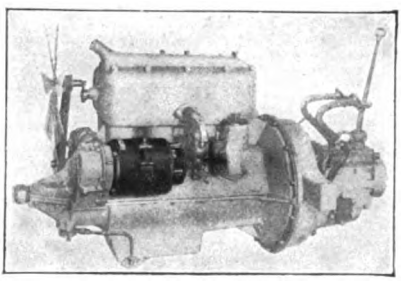
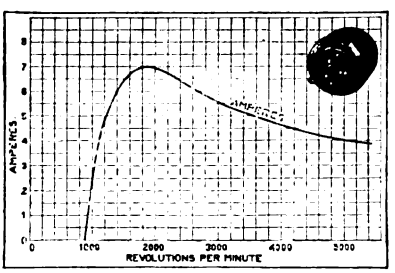
NORTH EAST ELECTRIC COMPANY'S SERVICE STATIONS—CONT'D



Starting Characteristics North East Model G 12-volt Starter-Generator



Application of Model "G" Starter-Generator



Generating Characteristics North East Model G 12-volt Starter-Generator Third Brush Control

GEORGIA

Atlanta: J. W. Goldsmith, Jr., Grant Co., 229-35 Peachtree Street.
Augusta: Augusta Elec. Storage Battery Co., 450 Broad Street
Cordele: O. S. Bazemore
Macon: Geo. W. & Thos. W. Gilmore, Inc., 256 2nd Street
Sandersville: Gilmore Brothers

IDAHO

Boise: Western Ignition & Battery Co., 119-21 S. 11th St

ILLINOIS

Chicago: North East Electric Co., 2701 S. Wabash Avenue
Peoria: Electrical Testing Co., 300 Knoxville Avenue.
Rockford: Keyt-Herrington-Price Auto Co., 118 N. Court Street
Springfield: Chapin Electric Garage, 407 E. Jackson Street

INDIANA

Evansville: Sieffert Bros., 419-21 Sycamore Street
Indianapolis: Robbins & Schildmeier Co., 954 Scioto Street
Terre Haute: Steinhart Greiger Auto Co., 323 Ohio Street

IOWA

Cedar Rapids: Monroe Battery Co., 201 4th Avenue
Davenport: Emeis Mfg. Co., 217-21 Iowa Street
Des Moines: Bernhard & Turner Auto Co., 506-12 7th Street
Fort Dodge: Tremain & Rankin Auto Co., 1104 Central Avenue
Keokuk: Ayer Motor Car Co., 723-25 Main Street
Sioux City: Storage Battery and Electrical Works, 519 6th Street

KANSAS

Arkansas City: Mears Bros.
Chanute: K. W. Battery Co., 16 S. Highland Avenue
Coffeyville: The Isham Garage Co.
Clay Center: Miller Co.
Fredonia: Singleton Supply Co.
Hutchinson: Mills Electric Co., 131 Sherman Street.
Salina: Central Auto and Machine Works
Topeka: The Keele Electric Co., 215 West Sixth Street
Wichita: The E. S. Cowie Electric Co., 1238 E. Douglas Ave.

KENTUCKY

Louisville: Southern Motors Co., 615 S. Third Street

LOUISIANA

Alexandria: Alexandria Battery Co., 216 Jackson Street
Lake Charles: Miller Bros. Motor Co., 210 W. Broad Street
Monroe: Monroe Hardware Co.
New Orleans: John M. Walton, 700 St. Charles Street
Rayne: Stamm Motor Car Co., Inc.

MAINE

Bangor: Bangor Motor Co., Main Street
Portland: Howard B. Chandler, 12 Park Avenue

MARYLAND

Baltimore: Richardson Auto Electric Corp., 10 W. Lafayette Avenue
Hagerstown: Central Garage & Elec. Supply Co., 112 S. Potomac Street

MASSACHUSETTS

Boston: Mitchell & Smith, 1090 Commonwealth Avenue
Boston: Henshaw Motor Co., 12 Griggs Street (Brighton)
Springfield: Mitchell & Smith, Inc., 67 Pecusic Avenue

MICHIGAN

Detroit: North East Electric Co., 805 Woodward Avenue
Grand Rapids: Leon S. Heth Co., 225 Bond Avenue
Jackson: Buell Auto Co., 226-28 W. Cortland Street
Lansing: Barker-Cole Electric Co., 114 N. Grand Avenue

MINNESOTA

Duluth: Russell S. Sherman Co., 701 E. Superior Street
Minneapolis: Harvey E. Mack Co., 1227-29 Harmon Pl. and 13th Street
Owatonna: C. Zamboni & Sons, 31-35 N. Cedar Street
Winona: Phenix Iron Works, 151 Winona Street

MISSISSIPPI

Meridian: Threefoot Bros. & Co.
Vicksburg: Miller Auto Co., 1011 Washington Street

MISSOURI

Kansas City: North East Electric Co., 1819 McGee Street
Springfield: Central Motor Car Sales Co., 425 St. Louis Street
St. Joseph: Farmer Auto Co., 11th and Frederick Streets
St. Joseph: The Electric Shop, 918-20 St. Francis Street
St. Louis: Tate-Gillham Motor Car Co., 3107-11 Locust Street

MONTANA

Billings: Electric Service Station, Inc., 12 N. 29th Street
Butte: Silver Bow Motor Car Co., cor. Park and Idaho Sts.
Helena: T. C. Power Motor Car Co., 534 North Main Street

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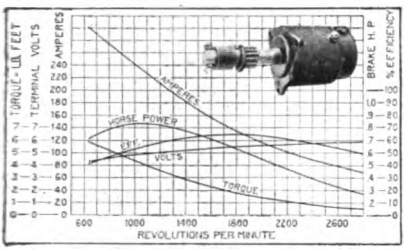
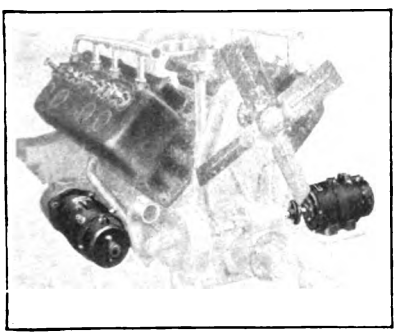
NORTH EAST ELECTRIC COMPANY'S SERVICE STATIONS—CONT'D

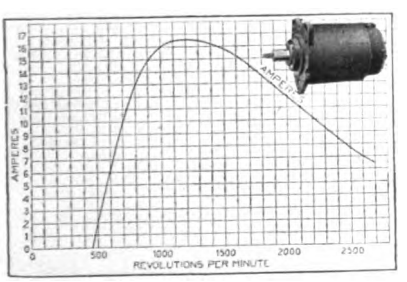


Characteristic Curve North East Model K—6 volt Starting Motor—Frame 8550 In-board Type of Automatic Screw Shift Pinion

Dubois Bul. 102



Application of Model "K" Starting Motor and Model "L" Generator



Characteristic Curve North East Model L—6 volt Generator—Frame 8500

NEBRASKA

Grand Island: Teeter & Homan, 112 E. Second Street
Lincoln: Randall & Noll, 317 S. 11th Street
Omaha: Auto Electric Service Co., 316 So. 19th Street
Scottsbluff: C. D. Snyder & Son
Syracuse: Pickering Motor Car Co.

NEVADA

Elko: E. S. Van Leer
Tonopah: Tonopah Electric & Tire Co.

NEW HAMPSHIRE

Manchester: Ernest E. Austin, 123 Canal Street

NEW JERSEY

Morristown: Victor A. Wiss & Bro., 10-14 Pine Street
Newark: Smith Motor Car Co., 921 Clinton Avenue
Newark: Bonnell Motor Car Co., 520-22 Broad Street
Trenton: Barber & Hearnen, 105-07 S. Warren Street

NEW MEXICO

Albuquerque: McCloskey Auto Co., 408-10 W. Copper Avenue

NEW YORK

Binghamton: Elco Engineering Co., 239-241 Water Street
Brooklyn: Bishop, McCormick & Bishop, 18 Halsey Street
Buffalo: Motor Parts Co., 1064-66 Main Street
New York City: North East Elec. Co., 125 West 51st Street
Rochester: North East Elec. Co., 391 Orchard Street
Schenectady: A. A. Seeley, Jr., 612-14 Smith Street
Syracuse: E. Q. Williams, 537 S. Clinton Street
Troy: Motor Car Service Works, 274-284 Second Street
Utica: E. D. & A. F. Cronk, 130 Hotel Street

NORTH CAROLINA

Charlotte: Garrett's Garage, 321 E. Trade Street
Winston-Salem: The Motor Co., Inc.

NORTH DAKOTA

Bismarck: Missouri Valley Motor Co., Inc., Main Street
Fargo: J. C. Vincent Co., 209-11 Northern Pacific Avenue
Grand Forks: Thos. McGoey, 115 N. Third Street
Minot: Fuller Motor Co., cor. Central Ave. and 2nd St.

OHIO

Cincinnati: Boyle Engineering Co., 1042 Gilbert Avenue
Cincinnati: The Mason Towle Co., 1116 Jackson Street
Cleveland: Bissinger's Magneto Co., 1611 Prospect Avenue
Columbus: Auto Electrical Supply Co., 231 N. Fifth Street
Dayton: Herbert F. Apple, 427 E. 3rd Street
Tiffin: Fleck's Electrical Service Station, 89 Jefferson St.
Toledo: Auto Repair & Machine Co., ft. of Washington St.

OKLAHOMA

Ardmore: Southern Motor Co.
Lawton: F. F. Thompson Garage
Muskogee: Peabody Battery & Starter Co., 221 W. Okamulgee Street.
Oklahoma City: McClelland-Gentry Motor Co., 727-29 N. Broadway
Tulsa: Auto Repair & Ignition Co., 113-15 S. Cheyenne Street.

OREGON

Pendleton: William E. Chase Co., 320 E. Court Street
Portland: Covey Motor Car Co., Washington at 21st Street
Portland: Gibson Elec. Garage & Storage Battery Co., 434 Alder Street

PENNSYLVANIA

Allentown: Dietrich Motor Car Co., 942-52 Linden Street
Erie: Electric Battery & Construction Co., 206 W. 12th St.
Harrisburg: Automotive Elec. Service Co., 17th and Kelly Sts.
Lancaster: Electric Equipment Co., 44 N. Prince Street
New Castle: Smith-Foster Motor Car Co., 25 N. Jefferson Street
Philadelphia: J. G. Duncan, Jr., Co., 1228 Race Street
Pittsburgh: Hiland Automobile Co., 5811-17 Center Avenue
Reading: The Reading Automobile Co., 126-128 North 5th St.
Uniontown: Electrical Equipment Co., 97 East Main St.
Wilkes-Barre: Frank F. Matheson, 694 Wyoming Avenue

RHODE ISLAND

Providence: Broadway Sales Co., 249 Washington Street

SOUTH CAROLINA

Charleston: Gas Engine & Electric Co., 174 King Street
Columbia: Auto Elec. Co., Inc., 1216 Hampton Ave.

SOUTH DAKOTA

Aberdeen: Wallace Parry, 301 S. Lincoln Street
Sioux Falls: C. W. Thompson Auto Co., 315-19 West 9th Street

TENNESSEE

Chattanooga: Citizens Auto Co.
Knoxville: McNutt & Co., 813 S. Gay Street
Memphis: Schlecht Motor Sale Co., 282-84 Monroe Avenue
Nashville: Cumberland Motor Co., Broadway at 15th Avenue

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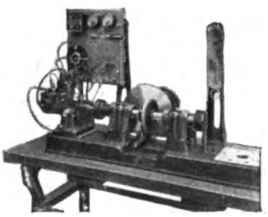
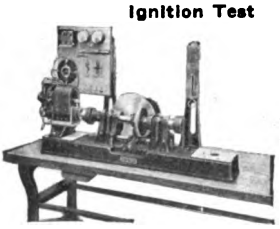
NORTH EAST ELECTRIC COMPANY'S SERVICE STATIONS—CONT'D

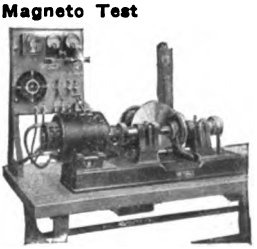
North East Service Station Test Bench



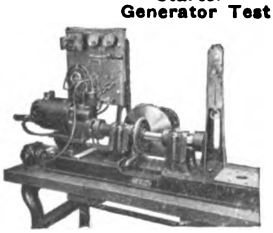
Ignition Test



Magneto Test



Starter-Generator Test



Ignition-Generator Test

TEXAS

Amarillo:	T. M. Caldwell Co., 119 W. Fifth Street
Austin:	Thomson Motor Car Co., 5th Ave. and Colorado St.
Dallas:	Trinity Motor Co., 2033-35 Commerce Street
El Paso:	Western Battery & Magneto Co., 314 E. Boulevard Street
El Paso:	Lone Star Motor Co.
Fort Worth:	Starter Service Co., 283 W. 10th Street
Gainesville:	A. H. Ross & Son, Southwest Corner Square
Galveston:	Galveston Motor Car Co.
Houston:	Hurlburt-Still Elec. Co., 1101 Capitol Avenue
Lubbock:	Mast & Robinson
Plainview:	Carter Motor Co.
San Angelo:	Ragsdale Auto. Supply Co., 8-10 Concho Avenue
San Antonio	A. E. Staacke Auto Co., Avenue D and 3rd Street
Snyder:	The Snyder Garage
Waco:	Central Motor Co.
Wichita Falls:	McFall & Orth

UTAH

Ogden:	Cheesman Auto Co., 2566 Washington Avenue
Salt Lake City:	Tom Botterill Auto Co., 36-42 State Street

VERMONT

Brattleboro:	Manley Bros.

VIRGINIA

Norfolk:	Reliance Electric Co., 711 Granby Street
Richmond:	Jones Motor Car Co., Inc., 1651-53 W. Broad Street
Richmond:	Electric Service Co., 731 W. Broad Street

WASHINGTON

Everett:	Ellarson's Battery Shop, 2819 Hoyt Avenue
Seattle:	Eaton & Campbell, 903 East Pike Street
Seattle:	Sunset Electric Co., 606 E. Pike Street
Spokane:	Riegel Bros., 1307 First Avenue
Tacoma:	Griffith Motor Co., 750-52 South A Street
Walla Walla:	Walla Walla Auto Electric Co.
Yakima:	Bell-Wyman Co.

WEST VIRGINIA

Wheeling:	McKelvey-Ewing Elec. Co., cor. Market and 10th Streets

WISCONSIN

Green Bay:	Lucia Bros. Motor Co., 218-220 N. Adams Street
Madison:	Madison Battery & Service Co., 227-29 N. Henry Street
Milwaukee:	Wisconsin Magneto Co., 528-530 Milwaukee Street

AUSTRALIA

Adelaide, S. A.:	Cheney Motor Co., Ltd.
Melbourne:	E. A. Machin & Co., Pty. Ltd., cor. Elizabeth & A'Beckett Streets

CANADA

Calgary, Alta.:	Motor Sales, Ltd., 334 Eighth Avenue West
Montreal, Que.:	Fehr Brothers, 172 Bleury Street
Toronto, Ont.:	Metropolitan Motors, Ltd., 22-26 Temperance St.
Vancouver, B. C.:	Elec. Maintenance Co., 737 Pender Street
Windsor, Ont.:	North East Electric Co., 83 Pierre Avenue
Winnipeg, Man.:	Cadillac Motor Sales Co., Ltd., 310 Carlton Street

CUBA

Havana:	Brouwer & Co., Morro No. 47

ENGLAND

London:	United Motor Industries, Ltd., 45 Poland St., London, W.

HAWAII

Honolulu:	The Von Hamm-Young Co., Ltd.

NEW ZEALAND

Auckland:	Watson & Steele, 28 Wakefield Street

NORWAY

Christiania:	Aktieselskabet Auto.

PHILIPPINE ISLANDS

Manila:	Levy Hermanos, 536-64 Gandara

PORTO RICO

San Juan:	The Specialty Shop for Automobiles

SOUTH AFRICA

Johannesburg:	South African General Electric Co., Southern Life Building

SOUTH AMERICA

Caracas, Venz.:	Salas & Marquiz, Apartado 193

North East Electric Co.

Rochester, N. Y.

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Recharging Batteries Ask for Catalogue No. 4

offers garage men a bigger opportunity for profits than anything else they can do.

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charges from one to eight 6-volt batteries at one time. Anyone can operate it. Our 9-G Generator charges one to twenty-four batteries at a time.

There are over 8,000 of our vibrating type Battery Chargers in use. Write for particulars.

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4057 Forest Park Boulevard
St. Louis Mo.

Dyneto

STARTING-LIGHTING SYSTEMS

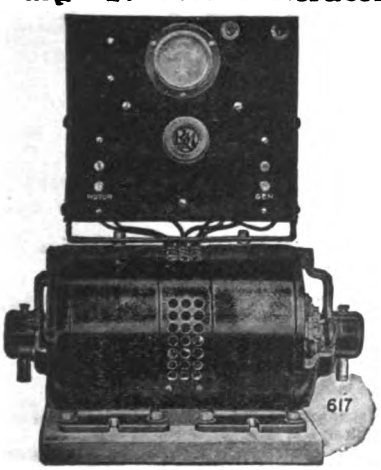
Single- and Two- Unit

Automobile manufacturers who have not satisfactorily solved their starting-lighting problems, and car owners whose starting-lighting systems are not all that might be desired, will do well to write to our Engineering Bureau. We will gladly study your particular problems and offer constructive suggestions without obligating you in the least.

We will also tell you how Dyneto Electric Lighting Plants can be built in out-of-the-way, isolated places, bringing the comforts and conveniences of electricity within the reach of everyone.

Dyneto Electric Corporation
Syracuse, New York

Robbins & Myers Battery Charging Motor-Generators



These outfits are furnished complete with switchboard, ammeter, rheostat and switches. They are made in three sizes—80, 150 and 250 watts. For operation from direct or alternating current circuits.

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FISHER Starters *for* Ford Cars

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Manufactured by

Fisher Electrical Works
No. 1 Lynn Street, Detroit, Mich.

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DYNAMOS, Tractor Electric Lighting

Dyneto Electric Corp., Syracuse, N. Y. (See page 269.)

North East Electric Co., Rochester, N. Y. (See pages 265 to 268.)

Remy Electric Co., 1623 E. Grand Blvd., Detroit, Mich.

Simms Magneto Co., 277 N. Arlington Ave., East Orange, N. J.

Reagle Co., 1125 Oregon Ave., Cleveland, O.

ECONOMIZERS, FUEL—See Mixers or Agitators, Fuel

EJECTORS, Steam

(For filling tanks on steam cars)

Penberthy Injector Co., Detroit, Mich.

ELBOWS, PIPE—See Fittings, Pipe

ELECTRIC BELLS—See Bells, Electric

ELECTRIC BRAKES—See Brakes, Electric

ELECTRIC CIGAR LIGHTERS—See Lighters, Electric Cigar

ELECTRIC CONDENSERS — See Condensers, Electric

ELECTRIC ENGINE STARTERS—See Starters, Electric Engine

ELECTRIC FUSES—See Fuses, Electric

ELECTRIC GARAGE DOOR OPENERS—See Openers, Electric Garage Door

ELECTRIC HEADLIGHTS—See Lamps, Electric Head

ELECTRIC HORNS—See Horns, Electric

ELECTRIC LAMP ADAPTERS — See Adapters, Electric Lamp

ELECTRIC LAMP CONNECTORS—See Connectors, Electric Lamp

ELECTRIC LAMP SOCKETS—See Sockets, Electric Lamp

ELECTRIC LAMPS—See Lamps, Electric

ELECTRIC LIGHTING BURNERS—See Burners, Special Acetylene Lamp

ELECTRIC LIGHTING DYNAMOS—See Dynamos, Electric Lighting

ELECTRIC LIGHTING SYSTEMS — See Systems, Electric Lighting

ELECTRIC LOCK SWITCHES—See Locks, Switch and Coil

ELECTRIC MIXTURE HEATERS—See Heaters, Mixture

ELECTRIC MOTOR COMMUTATORS—See Commutators, Electric Motor

ELECTRIC MOTORS—See Motors, Electric Automobile

ELECTRIC PORTABLE BUFFERS—See Drills, Electric Portable

ELECTRIC PORTABLE DRILLS—See Drills, Electric Portable

ELECTRIC PORTABLE GRINDERS—See Drills, Electric Portable

ELECTRIC PORTABLE POLISHERS—See Drills, Electric Portable

ELECTRIC SERVICE STATIONS—See Stations, Electric Service

ELECTRIC SIGNAL BELLS—See Bells, Electric

ELECTRIC SPEEDOMETER LAMPS FOR FORDS—See Lamps, Electric Speedometer

ELECTRIC STARTERS—See Starters, Electric

ELECTRIC WELDING—See Welding, Electric

ELECTRIC WELDING MACHINES—See See Machines, Electric Welding

ELECTRICAL CIRCUIT TESTING INSTRUMENTS—See Instruments, Electrical Circuit Testing

ELECTRICAL TEST CLIPS—See Clips, Electrical Test

ELECTRICAL TROUBLE CHARTS — See Charts, Electrical Trouble

ELECTRICALLY HEATED CLOTHING—See Clothing, Electrically Heated Aviator

ELECTRICALLY WOUND CLOCKS—See Clocks, Electrically Wound

ELECTROLYTE, Storage Battery

Contact Process Co., Abbott Rd., Buffalo, N. Y.

Grasselli Chemical Co., 347 Fifth Ave., New York, N. Y.

Kalbfleisch Corp., 31 Union Sq., W., New York, N. Y. (See page 87.)

ELEVATING ATTACHMENTS FOR FORDS—See Brackets, Timer Elevating

ELEVATING BODIES—See Bodies, Special Dumping

ELEVATING BRACKETS FOR FORDS—See Brackets, Timer Elevating

ELEVATORS, Garage

Brodesser Mfg. Co., Burleigh & Weil Sts., Milwaukee, Wis.

Buchanan Mfg. Co., 37 Van Rensselaer St., Eldorado, Ill.

Cohoes Iron Foundry & Machine Co., Cohoes, N. Y.

Eaton & Prince Co., Chicago, Ill.

Haughton Elevator & Machine Co., Huron & Lafayette Sts., Toledo, O.

Kieckhefer Elevator Co., A., 1026-1104 St. Paul Ave., Milwaukee, Wis.

Kimball Bros. Co., Ninth St. & 11th Ave., Council Bluffs, Ia.

McLauthlin Co., Geo. T., Boston, Mass.

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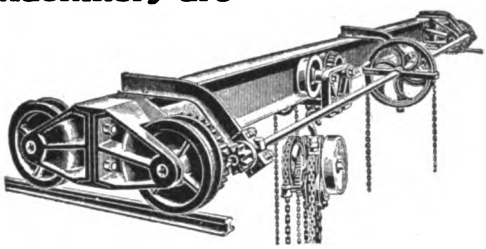
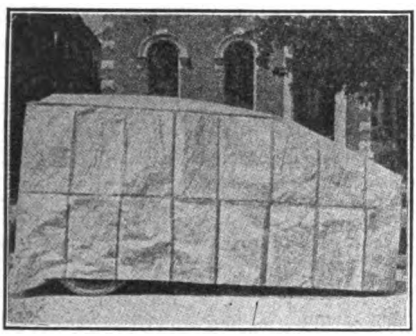
Elevators and Hoisting Machinery are recognized as standard for Garage Equipment

If you want Cranes, Hoists, Chain Blocks, Dumbwaiters, Handpower or Electric Elevators, Trolley Hoists, write



J. G. SPEIDEL
Reading Pa.



Kennedy Auto Storage Covers

To meet the need of an inexpensive and efficient cover for automobiles while in dead storage we are making a paper cover, which is proving the right thing for this purpose.

These covers are made of strong, heavy paper, properly reinforced to prevent tearing.

They protect the car against dirt, dust and moisture and will prevent the polished portions from tarnishing and the finish from checking in cold weather.

These covers are salable to individual car owners at a good profit as well as to furnish the dealer a protection for his stock of new cars.

We make them in four sizes: 7 Passenger, 5 Passenger, Ford Special, Electric

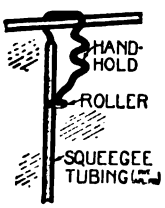
Winter will soon be here and dealers can handle these covers with satisfaction and profit. Further information on request.

The Kennedy Car Liner & Bag Co., Shelbyville, Ind.

SEE-SAFE

50c. Wind Shield Wiper

NEW
"SQUEEGEE-SHAPED" TUBING
ON
LATEST MODEL



Jobbers! Dealers! Don't pass this up! Order at once and cash in on this fast selling—high class—efficient—yet low priced Windshield Wiper.

The new Squeegee Tubing provides two wiping surfaces in contact with the glass and cleans the windshield perfectly.

A trial order will convince you!

STADEKER METAL SPECIALTY CO.
358 W. Madison St., Chicago

"LUXURY" Auxiliary Seats

The leading revolving folding seats for Automobiles.

Style "A" PATENTED

These seats are fully covered by patents, and are the most luxurious revolving auxiliary seats ever made. Instantly detachable. No disfiguring parts left in the car. Made in 5 styles. Fully padded and skeleton backs. In any color leather to match sample. Dovetail socket holds seat bracket.

Get our special prices to manufacturers and dealers. We guarantee prompt deliveries on quantity orders. New Catalog just out.

HODGE & GRAVES CO.
AMESBURY, MASS.

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ELEVATORS, Garage (Continued)

Otis Elevator Co., 11th Ave. & 26th St., New York, N. Y.
Reedy Co., H. J., 11-15 W. Second St., Cincinnati, O.
Reedy Elevator Co., Willow Ave. & 13th St., Hoboken, N. J.
Reedy Elevator Mfg. Co., J. W., Chicago, Ill.
Sedgwick Machine Works, 128 Liberty St., New York, N. Y.
Sidney Elevator Mfg. Co., Sidney, O.
Speidel, J. G., Reading, Pa. (See page 271.)
Storm Mfg. Co., 40-50 Vesey St., Newark, N. J.
Warner Elevator Mfg. Co., 2613 Spring Grove Ave., Cincinnati, O.

EMBLEM HOLDERS—See Holders, Flag, Pennant and Emblem

EMBLEMS OR FLAGS—See Flags, Pennants and Emblems

EMERGENCY CASES—See Cases, Medical

EMERGENCY CONTRACTING BRAKES FOR FORDS—See Brakes, Emergency Contracting

EMERGENCY REAR AXLE SPINDLES FOR FORDS—See Spindles, Emergency Rear Axle

EMERGENCY RIMS FOR FORDS—See Rims, Emergency

EMERY CLOTH—See Paper, Emery and Sand

EMERY PAPER—See Paper, Emery and Sand

EMERY, POWDERED—See Compounds, Valve Grinding

EMERY WHEEL DRESSERS—See Dressers, Emery Wheel

EMERGENCY ROPES—See Ropes, Tow

EMERGENCY TANKS—See Tanks, Emergency

ENAMEL REMOVERS—See Removers, Paint, Enamel and Varnish

ENAMELED CLOTH—See Cloth, Enameled

ENAMELS, AUTOMOBILE—See Paints, Enamel

ENAMELS, Lacquers and Finishes, Brass

(For blackening lamps, radiator and other brass work on car—See also Paints, Enamel; also Lacquers, Metal)

Arnold, N. B., 1 Sigourney St., Brooklyn, N. Y. "Slikup."
Auto Products Mfg. Co., Buffalo, N. Y. "Sta-On." (See page 255.)
Benoit, Constant A., Brooklyn, N. Y. "Permatex." (See page 169.)
Blue Ribbon—See International Metal Polish Co.
Bradley & Vrooman Co., 2629 Dearborn St., Chicago, Ill. "C. Q. P."
C. Q. P.—See Bradley & Vrooman Co.
Chicago Varnish Co., 2100 Elston Ave., Chicago, Ill.
Columbus Varnish Co., Columbus, O. "Peerless." (See page 253.)
Detroit White Lead Works, 530-60 Milwaukee Ave., E. Detroit, Mich. "Rogers."
Durkee-Atwood Co., Minneapolis, Minn. "Rie-Nie."
Enameling & Stamping Corp. of N. Y., Second & Webster Aves., Long Island City, N. Y.
Hall-Thompson Co., Hartford, Conn. (See page 739.)
Hollingshead Co., R. M. 112 N. Ninth St., Camden, N. J. "Whiz."
International Metal Polish Co., Quill St. & Belt R. R., Indianapolis, Ind. "Blue Ribbon."
Jet-Lac—See Hall-Thompson Co.
Jewel—See Wadsworth-Howland Co.
Leath-R-Nu—See Nu-Back Mfg. Co.
Martin-Senour Co., 2510 Quarry St., Chicago, Ill.
National Cement & Rubber Co., 300-16 S. St. Clair St., Toledo, O.
Northwestern Chemical Co., 610 State St., Marietta, O. "Norwesco." (See page 205.)
Norwesco—See Northwestern Chemical Co.
Nu-Back Mfg. Co., 114 N. Commercial St., St. Louis, Mo. "Leath-R-Nu."
Peerless—See Columbus Varnish Co.
Permatex—See Benoit, Constant A.
Puritan Soap Co., 500 Exchange St., Rochester, N. Y.
Rie-Nie—See Durkee-Atwood Co.
Rodriguez, R. E., 56-58 Warren St., New York, N. Y.
Rogers—See Detroit White Lead Works.
Schlegel Mfg. Co., Oscar, 111 E. 12th St., New York, N. Y.
Slikup—See Arnold, N. B.
Sonneborn Sons, L., 262 Pearl St., New York, N. Y. "3-Star." (See page 277.)
Stay-Bright Lacquer Co., 58 W. Washington St., Chicago, Ill.
Stay-on—See Auto Products Mfg. Co.
3-Star—See Sonneborn Sons.
Van Tilburg Oil Co., 2424-28 University Ave., S. E., Minneapolis, Minn. "Wang."
Wadsworth-Howland Co., 225 N. Carpenter St., Chicago, Ill. "Jewel."
Wadsworth, Howland & Co., 141 Federal St., Boston, Mass.
Wang—See Van Tilburg Oil Co.
Whiz—See Hollingshead Co.

ENAMELS, ENGINE—See Paints, Exhaust Pipe

ENAMELS, LAMP—See Enamels, Brass

ENAMELS, RADIATOR—See Enamels, Brass

ENAMELS, RIM—See Paints, Rim; also Paints, Aluminum and Bronze

ENDLESS BELTS—See Belts, Spiral Wire; also Belts, Endless Fabric

ENDLESS BELTS FOR FORDS—See Belts, Fan

ENDS, Aeroplane Strut

Barcalo Mfg. Co., 225 Louisiana St., Buffalo, N. Y.

ENGINE BOLTS FOR FORDS—See Bolts, Engine

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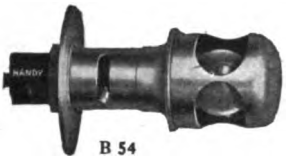
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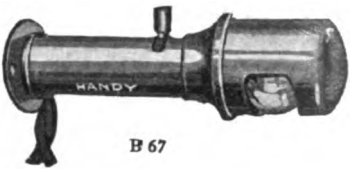

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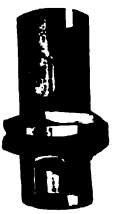
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A Handsome Display Case

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Use the "Handy" display cabinet for electric fittings. Carry the famous "Handy" line—sockets—plugs—connectors—switches—dash lamps—trouble lamps—bulbs and cigar lighters.

We sell this nine-drawer "Handy" cabinet already stocked with an assortment of one hundred plugs, switches, connectors, etc., in the most wanted style.

Let us prove to you how this cabinet, with a small stock of electric fittings, can attract new customers to your shop and pay you good profits with constant repeat orders.

On the consumer's side of the "Handy" cabinet each article is reproduced by photograph showing the number. On the salesman's side every drawer contains a tag with prices.

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Write immediately

and we will send you our latest folders, illustrating and describing the cabinet and our complete line of electric fittings.

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A finely finished article at a very low price. Standard equipment of Pierce-Arrow, White, Pathfinder and other high-class cars.

A. J. PICARD & CO., Inc. **9 West 61st St., N. Y.**

Elbow Plug

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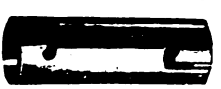
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ENGINE BUSHINGS FOR FORDS—See Bushings, Bronze

ENGINE CLEANERS—See Cleaners, Auto Engine

ENGINE DRIVEN BILGE PUMP—See Pumps, Motor Boat Engine Driven Bilge

ENGINE DRIVEN TIRE PUMPS—See Pumps, Engine Driven Tire

ENGINE LATHES—See Lathes, Engine

ENGINE OPERATED HORNS FOR FORDS—See Horns, Engine Operated

ENGINE PRIMERS—See Primers, Gasoline Engines

ENGINE STARTERS—See Starters; also Primers, Gasoline Engine

ENGINE TESTING DYNAMOMETERS—See Dynamometers, Testing

ENGINE VALVES—See Valves, Gasoline Engine

ENGINEERS, Consulting

Harding & Co., 122 S. Michigan Ave., Chicago, Ill. (See page 261.)

ENGINES, GASOLINE—See Motors, Gasoline

ENGINES, Steam Automobile

Ofeldt & Sons, F. W., Nyack, N. Y.
Stanley Motor Carriage Co., 44 Hunt St., Newton, Mass.

ENVELOPES, TOP—See Covers, Top

EQUALIZERS, Brake, for Fords

(Device to ensure the equal application of the brakes on both rear wheels to prevent skidding)

Cross Gear & Engine Co., 820 Bellevue Ave., Detroit, Mich. (See page 437.)

EQUALIZING GEARS—See Gears, Differential

ESCUTCHEON PINS—See Pins, Escutcheon

EXHAUST BOXES, MOTOR BOAT, UNDERWATER—See Boxes, Motor Boat Underwater Exhaust

EXHAUST DEFLECTORS FOR FORDS—See Deflectors, Exhaust

EXHAUST HORNS—See Horns, Exhaust

EXHAUST MANIFOLDS—See Manifolds

EXHAUST MUFFLERS—See Mufflers, Exhaust

EXHAUST PIPE PAINTS—See Paints, Exhaust Pipe

EXHAUST SILENCERS—See Mufflers, Exhaust

EXHAUST WHISTLES—See Horns, Exhaust

EXPANDERS, Boiler Tube

Ajax Mfg. Co., Pittsburgh (N. S.), Pa.
Forg, Peter, Somerville, Mass.
Martens Co., E. A., Lafayette, Ind.

EXPANDING BRAKES—See Brakes, Expanding

EXPANDING MANDRELS—See Mandrels, Expanding

EXTENSION WHEEL RIM PLATES, TRACTOR—See Plates, Tractor, Quick Detachable

EXTENSION REELS—See Reels, Automatic Extension

EXTENSIONS, Dummy Frame, for Fords

(For attaching to front of car to give appearance of springs)

Corcoran Mfg. Co., 4634 Spring Grove Ave., Cincinnati, O. "Peerless."
Peerless—See Corcoran Mfg. Co.

EXTENSIONS, Gear Shift Lever

(To enable driver to shift gears without unnecessary reaching)

M & H Novelty Co., 857 E. 24th St., Los Angeles, Cal. "Mellins."
Mellins—See M & H Novelty Co.

EXTENSIONS, Pedal

(For clutch and brake pedals so that adjustments in length may be made)

American Car Accessories Dept., 533 W. 21st St., New York, N. Y. "Pedex."
Borgfeldt & Co., Geo., 16th St. & Irving Pl., New York, N. Y. (Sole Distributors for Fit-All Adjustable Pedal Co., Tiffin, O.)
Fit-All Adjustable Pedal Co.—See Borgfeldt & Co.
Harrington, Fred, 312 S. Los Angeles St., Los Angeles, Cal.
Hill Pump Valve Co.—See Zinke Co.
Pedex—See American Car Accessories Co.
Rich Mfg. Co., 1777 Broadway, New York, N. Y. "Rico." (See page 277.)
Rico—See Rich Mfg. Co.
Zinke Co., 1323-25 Michigan Ave., Chicago, Ill. (Sole Distributors for Hill Pump Valve Co., Chicago, Ill.) (See page 551.)

EXTINGUISHERS, Automobile Fire

(For Car Equipment)

Fire Gun Mfg. Co., 115 Fourth Ave., New York, N. Y. (See page 275.)
Fyr-Fyter Co., Webb & Second Sts., Dayton, O.
Johns-Manville Co., H. W., Madison Ave. & 41st St., New York, N. Y.
Justrite Mfg. Co., 2061-81 Southport Ave., Chicago, Ill.
Protex Mfg. Co., 13-17 N. Jefferson St., Chicago, Ill. (See page 275.)
Pyrene Mfg. Co., 52 Vanderbilt Ave., New York, N. Y.

EXTINGUISHERS, Fire

(For Garage and Shop Equipment)

Acme—See Rex-Harris Fire Appliance Co. of N. Y.
American-La France Fire Engine Co., Elmira, N. Y. "Keystone," "Paragon."
Badger Chemical Mfg. Co., 143 Reed St., Milwaukee, Wis. "Mitchell," "Wisconsin."
Badger & Sons Co., E. B., 63-69 Pitts St., Boston, Mass.

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Reg. U. S. Pat. Office

SETS A NEW STANDARD

The Extinguisher that Never Fails

Shoots a Stream of Liquid which Vaporizes and Blankets the Fire Instantly.

Reduces automobile insurance 15%.

FIRE GUN holds 25% more than any other hand device, empties in about half the number of strokes, and is ready for the job whether it is new from the factory or battered by years of service.

Made under the supervision and RECOMMENDED by UNDERWRITERS' LABORATORIES, Inc.

Approved by UNITED STATES STEAMBOAT-INSPECTION SERVICE.

(Packed complete with bracket)

Made in the U. S. A. by

Fire Gun Manufacturing Co., Inc.

115 Fourth Avenue

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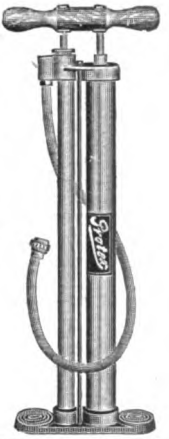
Protex Line Protects You Always

We Sell to Jobbers Exclusively

Manufacturers of the Famous Protex Bumpers which fit 95% of cars now on the market.

Other Protex Products

- Tire Removers.
- Tire Gauges.
- Tire Holders.
- Fire Extinguishers.
- Oil and Grease Guns.
- Triple Socket Wrenches.
- Combination Wrenches.
- Connecting Rod Wrenches.
- Double End Spark Plug Wrenches.
- Piston Ring Compressors.
- Breather and Oil Fillers.
- Tire Pumps.



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THE LIFE SAVING LINE

PROTEX Manufacturing Co.

TRADE MARK

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EXTINGUISHERS, Fire (Continued)

Childs Co., O. J., 138 W. Liberty St., Utica, N. Y. "Utica."
Deluge—See Prospect Mfg. Co.
Eclipse—See Haverhill Fire Appliance Co.
Esco—See Emmons Specialty Co.
Fire-Fly—See Northwestern Chemical Co.
Fire Gun Mfg. Co., 115 Fourth Ave., New York, N. Y. (See page 275.)
Firex Mfg. Co., 503 S. Jefferson St., Chicago, Ill.
Foamite Fire Extinguisher Co., 200 Fifth Ave., New York, N. Y.
Fyr-Fyter Co., Webb & Second Sts., Dayton, O.
Gammeter-Brodbeck Sales Co., 45 N. High St., Akron, O.
Haverhill Fire Appliance Co., 191 Merrimack St., Haverhill, Mass. "Eclipse."
J-M—See Johns-Manville Co.
J-M Success—See Johns-Manville Co.
Johns-Manville Co., H. W., Madison Ave. & 41st St., New York, N. Y. "Manville," "J-M Success," "J-M."
Justrite Mfg. Co., 2061-81 Southport Ave., Chicago, Ill.
Keystone—See American-La France Fire Engine Co.
La May Mfg. Co., 80 N. Water St., Rochester, N. Y.
Lazarus Mfg. Co., 750-80 Prospect Ave., Cleveland, O. "Lazco."
Lazco—See Lazarus Mfg. Co.
Manville—See Johns-Manville Co.
Minimax Co., 63 Wall St., New York, N. Y.
Mitchell—See Badger Chemical Mfg. Co.
Nevermyss Fire Extinguisher Co., Middletown, N. Y.
Northwestern Chemical Co., 610 State St., Marietta, O. "Fire-Fly." (See page 205.)
Paragon—See American-La France Fire Engine Co.
Pilabrasgo—See Pittsburgh Lamp, Brass & Glass Co.
Pittsburgh Lamp, Brass & Glass Co., Pittsburgh, Pa. "Pilabrasgo."
Prospect Mfg. Co., Prospect, O. "Deluge."
Pyrene Mfg. Co., 52 Vanderbilt Ave., New York, N. Y.
Regina—See Rex-Harris Fire Appliance Co. of N. Y.
Rex-Harris Fire Appliance Co. of N. Y., 39 E. 19th St., New York, N. Y. "Regina," "Acme," "Victor."
Stempel Fire Extinguisher Co., 4250 N. 20th St., St. Louis, Mo.
U. S.—See United Mfg. Co.
United Mfg. Co., Toledo, O. "U. S."
Utica—See Childs Co.
Victor—See Rex-Harris Fire Appliance Co. of N. Y.
Wisconsin—See Badger Chemical Mfg. Co.

EXTRACTORS, Broken Tap

Walton Co., 314 Pearl St., Hartford, Conn.

EXTRACTORS, Bushing, for Fords

Dyer Co., G. H., Cambridge, Mass. "Jiffy." (See page 505.)
Jiffy—See Dyer Co.
Jiffy Tool Co., Jenkins Blvd., Whitman, Mass. (See page 277.)

EXTRACTORS, CAR—See Winches and Blocks

EXTRACTORS, Stud Bolt

Cleveland Twist Drill Co., E. 49th St. & Lakeside Ave., Cleveland, O. "Ezy-out."
Ezy-out—See Cleveland Twist Drill Co.
Sprung, E., 226 Northwestern Ave., Detroit, Mich.

EXTRACTORS, TAP — See Extractors, Broken Tap

EYE PROTECTORS—See Goggles, Mechanics' and Welders'

EYE SHIELDS—See Goggles

EYEBOLTS, AEROPLANE— See Bolts, Aeroplane Eye

EYES, SCREW—See Screw-Eyes

FABRIC, Aircraft

(See also Linen, Aeroplane)

Goodrich Co., B. F., S. Main St., Akron, O.
Pierce Mfg. Corp, Belleville Ave., New Bedford, Mass.
United States Tire Co., Broadway & 58th St., New York, N. Y. "Usco." (See page 695.)
Usco—See United States Tire Co.

FABRIC BELTS—See Belts, Endless Fabric

FABRIC CLEANERS—See Cleaners, Fabric

FABRIC CLUTCH DISCS—See Lining, Brake

FABRIC, Cotton Tire

Atlas Mfg. Co.—See Brander & Curry.
Bay State Cotton Corp—See Boston Yarn Co.
Bibb Mfg. Co., Macon, Ga.
Boston Yarn Co., Boston, Mass. (Sole Distributor for Bay State Cotton Corp., Lowell, Mass.)
Brander & Curry, 30 E. 42d St., New York, N. Y. (Sole Distributors for Fitchburg Duck Mills, Fitchburg, Mass., and Atlas Mfg. Co., Bessemer City, N. C.)
Brighton Mills, Passaic, N. J.
Caldwell Co., R. J., 15 Park Row, New York, N. Y.
Catlin & Co., 345 Broadway, New York, N. Y.
Connecticut Mills Co., Danielson, Conn.
Fitchburg Duck Mills—See Brander & Curry.
Jenckes Spinning Co., Pawtucket, R. I.
Lane & Co., J. H., 334 Fourth Ave., New York, N. Y. (Sole Selling Agents for West Boylston Mfg. Co., East Hampton, Mass.)
Manhasset Mfg. Co., Turks Head Bldg., Providence, R. I.
Marlboro Cotton Mills, McColl, S. C.
Sears & Co., Wellington, 93 Franklin St., Boston, Mass.
Taylor, Armitage & Co., 120 Broadway, New York, N. Y.
Turner Co., J. Spencer, 86 Worth St., New York, N. Y.

FABRIC FAN BELTS—See Belts, Endless Fabric

FABRIC SPEEDOMETER PINIONS—See Gears and Pinions, Speedometer

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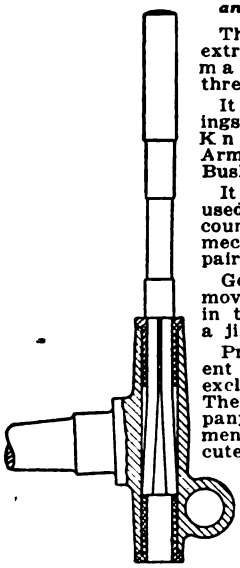
Jiffy Bushing Extractor

For Ford, Chevrolet, Dodge, Dort, Saxon and Overland Cars



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It removes bushings from Steering Knuckle, Spindle Arm and Spring Bushings.

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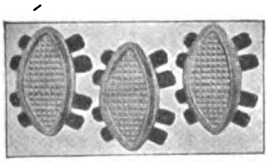

Pedal Pads for Ford Cars
One Set Will Outwear Three Sets of Any Other Kind

Real China Bristle Automobile Cleaning Brushes

RICH MFG. CO., 1777 Broadway, New York

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FABRICS, UPHOLSTERY AND TOP—See Cloth; also Broadcloth; also Silk; also Whipcord

FACINGS, BRAKE—See Lining, Brake

FACINGS, CLUTCH—See Lining, Brake; also Leather, Friction

FACINGS, FRICTION—See Frictions, Fibre

FACINGS, TRANSMISSION, FOR FORDS—See Lining, Brake

FAN BELT ADJUSTERS FOR FORDS—See Adjusters, Fan Belt

FAN BELT GUIDES—See Guides, Fan Belt

FAN BELTS—See Belts, Fan; also Belts, Spiral Wire; also Belts, Endless Fabric; also Belting, Leather

FAN HORNS—See Horns, Engine Operated

FAN PULLEYS—See Pulleys, Pressed Steel

FANS, Radiator

(See also Radiators)

A. Z. Co., 530 W. 56th St., New York, N. Y. (See page 563.)

Automotive Parts Co., Indianapolis, Ind. (See page 281.)

Buffalo Pressed Steel Co., Buffalo, N. Y. (See page 473.)

Hardy Mfg. Co., Pendleton, Ind. (See page 335.)

Hotz Foundry & Mfg. Co., Fremont, O.

Hunt & Dorman Mfg. Co., 1600 E. 24th St., Cleveland, O.

International Motor Products Co., 2037 S. Wabash Ave., Chicago, Ill. "Perfection."

Konigslow Mfg. Co., Otto E., 3701 Perkins Ave., Cleveland, O.

Oakes Co., Indianapolis, Ind. (See page 279.)

Perfection—See International Motor Products Co.

Pitter Fan Co., 208 S. La Salle St., Chicago, Ill. (See page 505.)

Sparks-Withington Co., Jackson, Mich. "Sparton."

Sparton—See Sparks-Withington Co.

FANS, Radiator, for Fords

Hotz Foundry & Mfg. Co., Fremont, O.

Perfection Auto Parts Co., 404 Lakeside Ave., N. W., Cleveland, O. (See page 493.)

Pitter Fan Co., 208 S. La Salle St., Chicago, Ill. (See page 505.)

FANS, Tractor Radiator

Holz Foundry & Mfg. Co., Fremont, O.

Oakes Co., Indianapolis, Ind. (See page 279.)

FASTENERS, Belt

Bristol Co., Waterbury, Conn.

Blakes—See Greene, Tweed & Co.

Buettner Co., Charles H., Cincinnati, O.

Campbell—See Perkins-Campbell Co.

Crescent Belt Fastener Co., 381 Fourth Ave., New York, N. Y.

Greene, Tweed & Co., 109 Duane St., New York, N. Y. "Blakes," "Morans."

Jenckes Mfg. Co., E., 28 Union St., Worcester, Mass.

Lakewood Fabric Belting & Mfg. Co., 1518 Highland Ave., Lakewood, O.

Morans—See Greene, Tweed & Co.

Perkins-Campbell Co., 634 Broadway, Cincinnati, O. "Campbell." (See page 227.)

Smith & Co., F. P., 114 Railroad Ave., Sharon Hill, Pa. "Smithicks."

Smithicks—See Smith & Co.

Stewart & Co., 351 W. 26th St., New York, N. Y.

FASTENERS, BOW—See Holders, Top Bow

FASTENERS, BOW, FOR FORDS—See Clamps, Top Bow

FASTENERS, BOX—See Catches, Spring

FASTENERS, CHAIN—See Fasteners, Tire Chain

FASTENERS, Curtain

Acme—See Scovill Mfg. Co.

Ajax—See Metal Stamping Co.

Anchor—See North & Judd Mfg. Co.

Anderson Electric Machine Tool Co., 1118 Cass Ave., St. Louis, Mo.

Automatic Carburetor Co., 1422 Bryan Pl., Chicago, Ill. "Church."

Badger Mfg. Corp., Milwaukee, Wis. "Cinch." (See page 139.)

Boston Fastener Co., 144-46 W. 37th St., New York, N. Y.

Brewer-Tichener Corp., 115 Port Watson St., Cortland, N. Y. "Pioneer," "Premier," "Presto."

Brewster—See Cowles & Co.

Carr Fastener Co., 31 Ames St., Cambridge, Mass. "Durable," "Common Sense," "Lift the Dot." (See page 345.)

Chase & Co., L. C., Boston, Mass. "Cinch." (See page 497.)

Church—See Automatic Carburetor Co.

Cinch—See Badger Mfg. Corp.

Cinch—See Chase & Co.

Common Sense—See Carr Fastener Co.

Cowles & Co., C., New Haven, Conn. "Brewster," "Excelsior," "Ideal," "Perfect," "Success." (See page 339.)

Desoco—See Detroit Socket Co.

Detroit Socket Co., 814 Jefferson Ave., W., Detroit, Mich. "Desoco."

Durable—See Carr Fastener Co.

English & Mersick Co., New Haven, Conn. (See page 573.)

Excelsior—See Cowles & Co.

Federal Equipment Co., Union St., Marietta, O.

Ideal—See Cowles & Co.

Jarvis Co., Charles L., Gildersleeve, Conn.

Jonah & George, Merrimac, Mass.

Kentucky—See Neider Co.

Leader—See Neider Co.

Lift the Dot—See Carr Fastener Co.

Metal Stamping Co., 13th St. & Boulevard, Long Island City, N. Y. "Perfection," "Perfecto," "Ajax."

Monarch Carriage Goods Co., 2838-44 Spring Grove Ave., Cincinnati, O.

Murphy Co., G. W. J., Amesbury, Mass. "Leader," "Kentucky."

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Cooling Over a Million Motors

is the tremendous task in which Oakes Radiator Cooling Fans are today playing a vital part.

On 230 leading makes of America's tractors, trucks and automobiles, Oakes Fans are standard equipment.

These two facts alone are ample reason why your specifications should include Oakes Fans. But there are other reasons, just as logical and vital. Here are a few:

Back of every Oakes Fan stands the Oakes organization—the largest in the world devoted exclusively to making radiator fans.

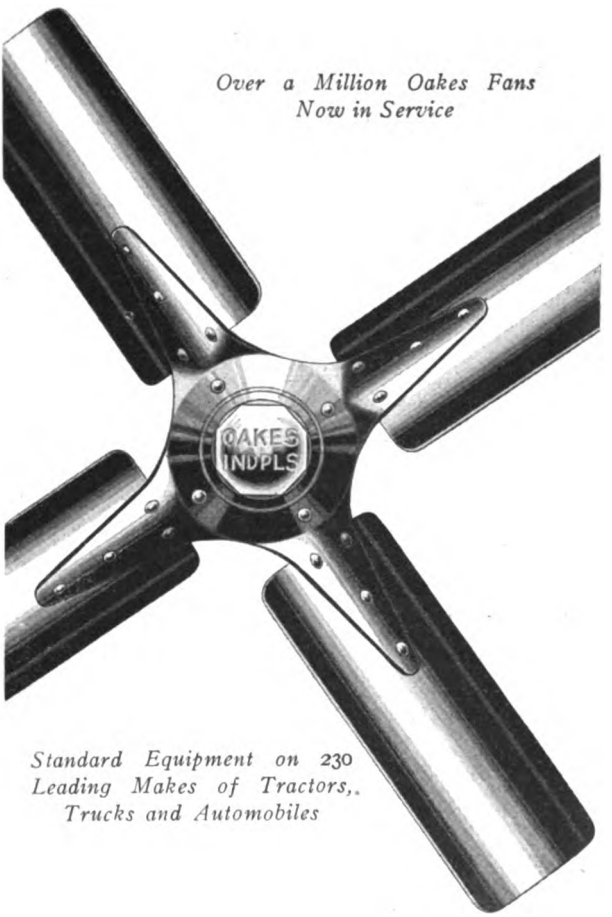
The Oakes engineering staff have for over 8 years studied cooling needs of all types of motors. They can design a fan which will fully meet the special cooling requirements of your engine.

Oakes maintains its own testing laboratory, where every design of Oakes Fan is subjected to severe tests to *prove* its efficiency.

The high financial standing of the Oakes Company, coupled with a big modern factory, makes possible a tremendous production of high quality fans.

At the recent Salina tractor demonstration 76.4% of the tractors using fans made by a fan manufacturer were Oakes equipped.

Write us for prices, sending blue prints and full details on dimensions, fan rotation, etc.



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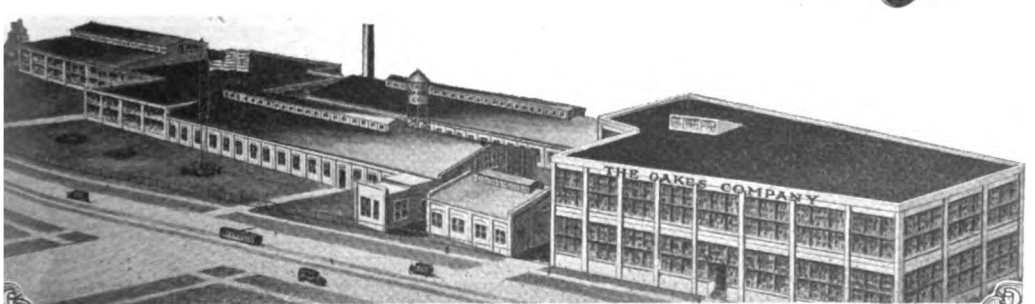
Standard Equipment on 230 Leading Makes of Tractors, Trucks and Automobiles



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FASTENERS, Curtain (Continued)

Neider Co., F. A., Augusta, Ky. "Peerless."
North & Judd Mfg. Co., New Britain, Conn. "Perfection," "Anchor." (See page 521.)
Novelty Mfg. Co., 125 Maple St., Waterbury, Conn.
O'Brien Mfg. Co., Joseph F., 391 Broadway, New York, N. Y.
Peerless—See Neider Co.
Perfect—See Cowles & Co.
Perfection—See Metal Stamping Co.
Perfection—See North & Judd Mfg. Co.
Perfecto—See Metal Stamping Co.
Pioneer—See Brewer-Tichener Corp.
Premier—See Brewer-Tichener Corp.
Presto—See Brewer-Tichener Corp.
Reliable—See Smith & Co.
Roehm & Davison, Woodbridge & Wayne Sts., Detroit, Mich.
Seovill Mfg. Co., Waterbury, Conn. "Acme." (See page 659.)
Smith & Co., Jos. N., E. Grand Blvd. & Dubois St., Detroit, Mich. "Reliable."
Strong Co., M. H., 168 South Ave., Rochester, N. Y.
Success—See Cowles & Co.
Taylor Co., H. D., 101-05 Oak St., Buffalo, N. Y.
United States Fastener Co., 95 Milk St., Boston, Mass. (See page 483.)
Wilcox, Crittenden & Co., 82 Main St., Middletown, Conn.
Woodruff & Sons Co., Walter W., Mount Carmel, Conn.

FASTENERS, Hood

A. Z. Co., 530 W. 56th St., New York, N. Y. (See page 563.)
Attwood Brass Works, Grand Rapids, Mich. (See page 531.)
Bassick Co., 38 Austin St., Bridgeport, Conn.
Bush Mfg. Co., Hartford, Conn. (See page 573.)
Eastern Production Co., 137 Leib St., Detroit, Mich. (See page 345.)
Eberhard Mfg. Co., 2734 Tennyson Rd., Cleveland, O.
English & Mersick Co., New Haven, Conn. (See page 573.)
Evertight—See Gemco Mfg. Co.
Ferro Stamping & Mfg. Co., 287-97 Franklin St., Detroit, Mich.
Ford-Clark Co., 3125 Perkins Ave., Cleveland, O.
Gemco Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. "Evertight." (See page 135.)
Ideal Brass Works, 560 N. Elder Ave., Indianapolis, Ind.
Imperial Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill. (See page 733.)
Keeler Brass Co., 261-71 Godfrey Ave., Grand Rapids, Mich.
Medina Stamping & Machine Co., 317 Main St., Medina, N. Y.
Monarch Carriage Goods Co., 2838-44 Spring Grove Ave. Cincinnati, O.
Pfau Mfg. Co, Cincinnati, O.
Sergeant Mfg. Co., New & Summit Sts., Newark, N. J.
Western Brass Mfg. Works, Marshall Blvd., 21st St. & C., B. & Q. R. R., Chicago, Ill.
Woodruff & Sons Co., Walter W., Mount Carmel, Conn.

FASTENERS, HOOD, FOR FORDS—See Clamps, Hood

FASTENERS, Tire Chain

Cross Chain Fastener Co., Rose Bldg., Cleveland, O. "Q. D."
Faus, Jr., Jacob, 413 Spruce St., Boulder, Colo.
Q. D.—See Cross Chain Fastener Co.

FASTENERS, Ventilating Hood, for Fords

V Air Valve & Mfg. Co., 1648 Tremont St., Denver, Colo.

FEED SYSTEMS, GASOLINE—See Systems, Gasoline Feed; also Tanks, Vacuum; also Regulators, Tank Pressure

FEEDERS, WATER—See Moisteners, Air

FELLOES, WOOD—See Rims, Wood

FELT GASKETS—See Washers, Felt

FELT GASKETS FOR FORDS—See Gaskets, Felt

FELT, Sheet

(For Felt Washers or Gaskets—See Washers, Felt)

Advance Felt Specialty & Cutting Co., 315 S. Jefferson St., Chicago, Ill. (See page 287.)
American Felt Co., 100 Summer St., Boston, Mass. (See page 283.)
Booth Felt Co., 440-50 19th St., Brooklyn, N. Y. (See page 749.)
Commonwealth Felt Co., 76 Summer St., Boston, Mass.
Rhodes & Co., James H., 157 W. Austin Ave., Chicago, Ill.
Stroock & Co., S., 11-13 E. 26th St., New York, N. Y.
Western Felt Works, 4115-33 Ogden Ave., Chicago, Ill.

FELT TESTING INSTRUMENTS—See Instruments, Rubber and Felt Testing

FELT, Upholstery

(For use in place of hair or moss; for Hair—See Hair Upholstery; for Moss—See Moss, Upholstery)

Newark Hair Felt Co., Lansdale, Pa.
Textile By-Products Corp., 26 Exchange Pl., New York, N. Y.

FELT WASHERS—See Washers, Felt

FELT WASHERS FOR FORDS—See Gaskets, Felt

FENDER BRACES FOR FORDS—See Braces, Mud Guard

FENDER CLAMPS FOR FORDS—See Braces, Mud Guard

FENDER ROLLING MACHINES—See Machines, Fender Rolling

FENDER WIRING MACHINES—See Machines, Fender Wiring

FENDERS, Automobile

(Safety Devices for front of car; see also Bumpers, Automobile)

Hero Mfg. Co., Gaul & Adams Sts., Philadelphia, Pa.

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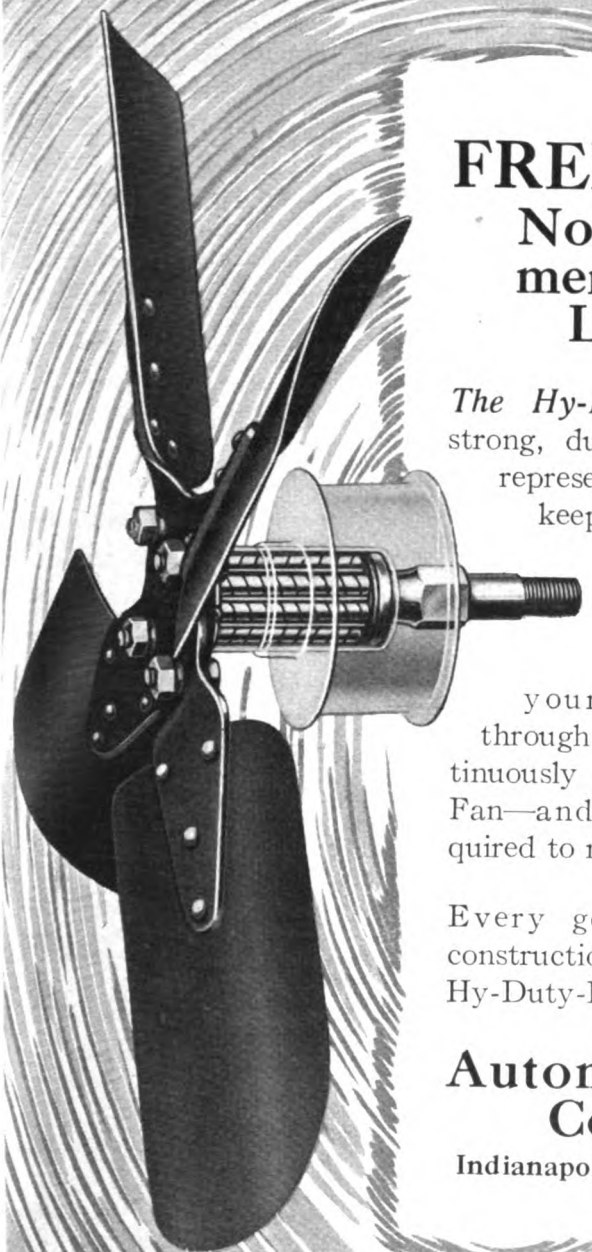

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Indianapolis, Indiana, U. S. A.

The HY-DUTY FAN

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FENDERS, Automobile (Continued)

Linquist, Wm. A., 901-03 Marquette Ave., Minneapolis, Minn.

Mitchell & Son, G. F., 6501 Cedar Ave., Cleveland, O.

Safety First Appliance Co., Woodward Bldg., Washington, D. C.

Sav-A-Life Fender Co., Society for Savings Bldg., Cleveland, O.

Standard Fender Co., 333 S. Clinton St., Chicago, Ill.

FENDERS or MUD GUARDS, Leather

McKinnon Dash Co., 252 Amherst St., Buffalo, N. Y. (See page 663.)

FENDERS or MUD GUARDS, Metal

A. Z. Co., 530 W. 56th St., New York, N. Y. (See page 563.)

Auto Metal Co., 531 Worthington St., Springfield, Mass.

Auto Radiator Mfg. Co., 1712 S. Michigan Ave., Chicago, Ill.

Briskin Mfg. Co., 215 S. Hoyne Ave., Chicago, Ill.

Brummeler's Sons Co., Wm., 413 Ionia Ave., S. W., Grand Rapids, Mich. "Brusco."

Brusco—See Brummeler's Sons Co.

Bush Mfg. Co., Hartford, Conn. (See page 573.)

Chicago Mfg. Co., 1458-64 Michigan Ave., Chicago, Ill. (See page 741.)

Clayton & Lambert Mfg. Co., Detroit, Mich. (See page 743.)

Columbus Auto Brass Co., Columbus, O. (See page 395.)

Cornwall Mfg. Co., E. 128th St. & Penobscot Ave., Cleveland, O.

Detroit Auto Specialty Co., 909-11 Greenwood Ave., Detroit, Mich.

Hale-Kilburn Corp., 18th St. & Glenwood Ave., Philadelphia, Pa.

Hayes Mfg. Co., 481 Maybury Grand Ave., Detroit, Mich.

Johnson's Automobile Sheet Metal Works, W. N., 620-28 South J St., Richmond, Ind.

Kells Mfg. Co., W. J., 521-25 W. 45th St., New York, N. Y. (See page 575.)

Lawco—See Lawson Co.

Lawson Co., F. H., Dept. D., Cincinnati, O. "Lawco." (See page 663.)

Maco—See McDole Automobile Sheet Metal Works.

McDole Automobile Sheet Metal Works, 218-20 E. Water St., Kalamazoo, Mich. "Maco." (See page 285.)

Metal Auto Parts Co., Industrial Bldg., Indianapolis, Ind.

Michigan Crown Fender Co., Ypsilanti, Mich.

Michigan Stamping Co., Mack Ave. & Detroit Terminal, Detroit, Mich.

Moline Pressed Steel Co., East Moline, Ill.

Motors Metal Mfg. Co., Milford Ave. & P. M. R. R., Detroit, Mich.

Mullins Co., W. H., 182 Franklin St., Salem, O.

Murray Mfg. Co., J. W., Clay & St. Aubin Aves., Detroit, Mich.

Paragon Auto-Parts Mfg. Co., 506 W. 53d St., New York, N. Y.

Perfex Radiator Co., Racine, Wis.

Saginaw Sheet Metal Works, 2060 Genesee St., Saginaw, Mich.

Sargeant Mfg. Co., New & Summit Sts., Newark, N. J.

Shotwell-Hobart-Johnson Co., 712-22 Ontario Ave. N, Minneapolis, Minn.

Todd Mfg. Co., Minneapolis, Minn. (See page 571.)

Wilson & Bowen, 1318 S. Main St., Los Angeles, Cal.

York Corrugating Co., York, Pa.

FENDERS or MUD GUARDS, Wood

Dann Bros. & Co., 80-88 Franklin St., New Haven, Conn.

Haberkorn & Co., C. H., Brooklyn & Eighth Sts., Detroit, Mich.

FENDERS or MUD GUARDS, for Fords

(Including both standard and special crown fenders)

Black Crown—See Murray Auto Parts Mfg. Co.

Chicago Mfg. Co., 1458-64 Michigan Ave., Chicago, Ill. (See page 741.)

Columbus Auto Brass Co., Columbus, O. (See page 395.)

Corcoran Mfg. Co., 4634 Spring Grove Ave., Cincinnati, O.

Hayes Mfg. Co., 481 Maybury Grand Ave., Detroit, Mich.

Lawco—See Lawson Co.

Lawson Co., F. H., Dept. D, Cincinnati, O. (See page 663.)

Metal Auto Parts Co., Industrial Bldg., Indianapolis, Ind.

Michigan Crown Fender Co., Ypsilanti, Mich.

Murray Auto Parts Mfg. Co., 703-26 Carr St., Cincinnati, O. "Black Crown."

Superior Lamp Mfg. Co., 136 W. 52d St., New York, N. Y.

FENDERS or MUD GUARDS, Tractor

Kells Mfg. Co., W. J., 521-25 W. 45th St., New York, N. Y. (See page 575.)

Moore Mfg. Co., Waterloo, Iowa.

York Corrugating Co., York, Pa.

FENDERS or GUARDS, Truck Radiator

Cornell Iron Works, 601 W. 26th St., New York, N. Y. (See page 531.)

FERRULES, AEROPLANE WIRE—See Thimbles and Ferrules, Wire

FIBRE CLEATS—See Cleats, Fibre

FIBRE GEARS—See Gears, Rawhide and Fibre

FIBRE, Hard

(Sheet, Rod and Tube)

American Vulcanized Fibre Co., Equitable Bldg., Wilmington, Del. "Vul-Cot."

Brandywine Fibre Products Co., 1406 Walnut St., Wilmington, Del. (See page 711.)

Continental Fibre Co., Newark, Del. (See page 199.)

Delaware Hard Fibre Co., Wilmington, Del.

Diamond F—See Diamond State Fibre Co.

Diamond State Fibre Co., Bridgeport, Pa. "Diamond F."

Fibre Specialty Mfg. Co., Kennett Sq., Pa.

Keystone Fibre Co., Yorklyn, Del.

National Fibre & Insulation Co., Yorklyn, Del. (See page 285.)

Spaulding & Sons Co., J., Wheeler St., Tonawanda, N. Y.

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Felt Gaskets
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FIBRE, Hard (Continued)

Standard Fibre Co., 11-15 Miller St., Somerville, Mass.

Vul-Cot—See American Vulcanized Fibre Co.

Wilmington Fibre Specialty Co., Wilmington, Del. (See page 285.)

FIBRE PINIONS—See Gears and Pinions, Rawhide

FIFTH WHEELS—See Wheels, Fifth

FIGURES, METAL PATTERN—See Letters, Pattern

FILES and RASPS

Akron File Co., Hill & Forge Sts., Akron, O.

American—See Nicholson File Co.

American Swiss File & Tool Co., 24 John St., New York, N. Y.

Arcade—See Nicholson File Co.

Barnett Co., C. & H., 1076 Franklin St., Philadelphia, Pa. "Black Diamond."

Better-Cut—See Racine File Co.

Black Diamond—See Barnett Co.

Chatterton File Works, 38 Randall St., Providence, R. I.

Chelsea File Works, Sherman St., Norwich, Conn.

Colonial File Co., 167-70 Tenean St., Neponset, Mass. "Puritan."

Delta File Works, 3227 Frankford Ave., Philadelphia, Pa.

Disston & Sons, H., Tacony, Philadelphia, Pa.

Eagle—See Nicholson File Co.

Gem City File Works Co., 1120-24 Broadway, Quincy, Ill.

Gold Medal File Co., 20th St. & Allegheny Ave., Philadelphia, Pa.

Graves File Co., 67 N. J. R. R. Ave., Newark, N. J.

Great Western—See Nicholson File Co.

Grobet—See Montgomery & Co.

Haves File Co., 474-78 Franklin St., Detroit, Mich.

Heller Bros. Co., 865 Mt. Prospect Ave., Newark, N. J.

J. B. Smith—See Nicholson File Co.

Johnson & Bro., 154-56 Avon Ave., Newark, N. J. "Reliance."

Kearney & Foot—See Nicholson File Co.

McCaffrey File Co., Fifth & Berks Sts., Philadelphia, Pa.

McClellan—See Nicholson File Co.

Madden & Morrison File Co., 76-78 Dolsen Ave., Middletown, N. Y.

Montgomery & Co., 105-07 Fulton St., New York, N. Y. (Importers.) "Grobet."

Murcott & Campbell, 296-300 Union Ave., Brooklyn, N. Y.

Nicholson File Co., Providence, R. I. "American," "Arcade," "Eagle," "XF," "McClellan," "Kearney & Foot," "J. B. Smith," "Great Western."

Puritan—See Colonial File Co.

Racine File Co., Racine, Wis. "Better-cut."

Reliance—See Johnson & Bro.

Rex File & Saw Co., New Comerstown, O.

Reynolds Bros., 180 N. Water St., Columbus, O.

Simonds Mfg. Co., North St., Fitchburg, Mass.

Trojan—See Troy File Works.

Troy File Works, Congress St., Troy, N. Y. "Trojan."

Westphal File Co., 31st & Cherry Sts., Milwaukee, Wis.

Whitaker Mfg. Co., 409 S. Green St., Chicago, Ill.

XF—See Nicholson File Co.

FILLERS, Aircraft Wood

Valentine & Co., 456 Fourth Ave., New York, N. Y. "Valspar."

Valspar—See Valentine & Co.

FILLERS, GREASE GUN—See Loaders, Grease Gun

FILLERS, Paint

Asme White Lead & Color Works, 1740-1800 St. Aubin Ave., Detroit, Mich.

Berry Bros., 71 Lieb St., Detroit, Mich. "Lionoil."

Bradley & Vrooman Co., 2629 Dearborn St., Chicago, Ill. "C. Q. P."

Bridgeport Wood Finishing Co., New Milford, Conn. "Wheelers."

C. Q. P.—See Bradley & Vrooman Co.

Capitol City—See Indianapolis Paint & Color Co.

Celox.—See Valentine & Co.

Chase, Roberts & Co., Fifth St. & West Ave., Long Island City, N. Y.

Chicago Varnish Co., 2100 Elston Ave., Chicago, Ill. "Chi-Var-Co."

Chi-Var-Co.—See Chicago Varnish Co.

Detroit White Lead Works, 530-60 Milwaukee Ave., E., Detroit, Mich. "Rogers."

Ditzler Color Co., 18 W. Baltimore Ave., Detroit, Mich.

Esco—See Smith & Co.

Flint Varnish & Color Works, Flint, Mich.

Flood & Conklin Co., 136 Chestnut St., Newark, N. J.

Forest City Paint & Varnish Co., 3334 Lakeside Ave., Cleveland, O.

Graves Co., N. Z., 22-26 S. Third St., Philadelphia, Pa.

Hildreth Varnish Co., 90 West St., New York, N. Y.

Hilo—See Moller & Schumann Co.

Indianapolis Paint & Color Co., 118 W. Chesapeake St., Indianapolis, Ind. "Capitol City."

Johnston Paint Co., R. F., Pearl & Main Sts., Cincinnati, O. "Krakno."

Keystone Paint & Filler Co., Muncy, Pa

Krakno—See Johnston Paint Co.

Lionoil—See Berry Bros.

Masury & Son, John W., 44-50 Jay St., Brooklyn, N. Y.

Moller & Schumann Co., 3 Gerry St., Brooklyn, N. Y. "Hilo."

Moser Co., Chas., Cincinnati, O.

Mound City Paint & Color Co., 11th & Mullanphy Sts., St. Louis, Mo.

Murphy Varnish Co., Chestnut & McWhorter Sts., Newark, N. J.

Nice, Eugene E., 272 S. Second St., Philadelphia, Pa.

Phoenix Paint & Varnish Co., 124 Market St., Philadelphia, Pa.

Reno Bros. Paint Co., Pulaski, Pa.

Rogers—See Detroit White Lead Works.

St. Louis Surfacer & Paint Co., Arlington Ave. & Terminal Belt Line, St. Louis, Mo.

Schrack & Co., 152 N. Fourth St., Philadelphia, Pa.

Smith & Co., Edward, Sixth St. & West Ave., Long Island City, N. Y. "Esco."

Valentine & Co., 456 Fourth Ave., New York, N. Y. "Celox."

Wheelers—See Bridgeport Wood Finishing Co.

Wilhelm Co., A., Third & Bern Sts., Reading, Pa

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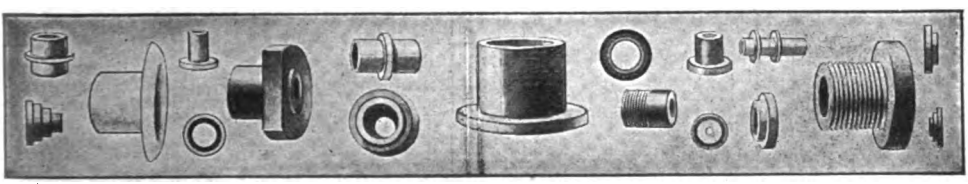
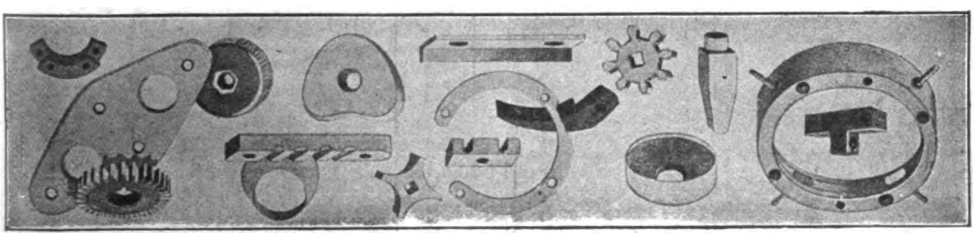


WILMINGTON FIBRE



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FILLERS, TIRE—See Compounds, Tire Filling

FILLERS, WOOD—See Fillers, Aircraft Wood

FILLING COMPOUNDS—See Compounds, Tire Filling

FILTERS AND CLARIFIERS, CENTRIFUGAL—See Separators, Oil

FINANCIAL BROKERS—See Brokers, Financial

FINISHED PISTONS—See Pistons, Finished and Machined

FINISHING STRIPS FOR FORDS—See Strips, Wood Door

FINISHING WASHERS—See Washers, Finishing

FINS, RADIATOR—See Discs, Radiator

FIRE EXTINGUISHERS—See Extinguishers, Fire; also Extinguishers, Automobile Fire

FIRE POTS—See Furnaces, Soldering

FIRE TUBE BOILERS—See Boilers

FIRST AID CABINETS—See Cases, Medical Emergency

FIRST AID CASES—See Cases, Medical Emergency

FIRST AID KITS—See Cases, Medical Emergency

FITTINGS, COMPRESSION—See Unions, Tubing

FITTINGS, Car Lowering, for Fords

Domelco—See Dominick & Co.

Dominick & Co., Wm., 2220 Indiana Ave., Chicago, Ill. "Domelco."

FITTINGS, CURTAIN OPENING — See Openers, Curtain

FITTINGS, Pipe

(For Tubing or Brazing Fittings—See Tubing Unions)

Bard Union Co., Norwich, Conn.

Barrett Mfg. Co., James, 117 Pearl St., Boston, Mass.

Belfield Co., H., 435 N. Broad St., Philadelphia, Pa.

Buckeye Iron & Brass Works, 324 E. Third St., Dayton, O.

Commonwealth Brass Corp., Commonwealth Ave. & Grand Trunk Ry., Detroit, Mich.

Crane Co., 836 S. Michigan Ave., Chicago, Ill.

Dalton-Ingersoll Mfg. Co., 171-75 High St., Boston, Mass.

Detroit Valve and Fittings and Detroit Brass Works, 99 Hobart St., Detroit, Mich.

Hamlin & Emery Brass Co., 49 Island St., Boston, Mass.

Imperial Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill. (See page 733.)

Jarecki Mfg. Co., 149 E. Ninth St., Erie, Pa.

Kelly & Jones Co., Greensburg, Pa.

Kinsey & Mahler Co., 400 S. Adams St., Peoria, Ill.

Lunkenheimer Co., Beekman & Waverly Sts., Cincinnati, O.

McDonald Mfg. Co., A. Y., Dubuque, Ia.

McNab & Harlin Mfg. Co., 55 John St., New York, N. Y.

McRae & Roberts Co., 221-35 Campbell Ave., Detroit, Mich.

Michigan Lubricator Co., Detroit, Mich. (See page 195.)

Pittsburg Valve & Fittings Co., Barberton, O.

Powell Co., Wm., 2525 Spring Grove Ave., Cincinnati, O. (See page 195.)

Powhatan Brass & Iron Works, Ransom, W. Va.

Richardson-Phenix Co., 122-28 Reservoir Ave., Milwaukee, Wis. "Union Cinch."

Roberts Brass Mfg. Co., 1395-1407 Fort St., W., Detroit, Mich.

Sherman Mfg. Co., H. B., 12 Barney St., Battle Creek, Mich.

Stoddard Union Co., Grand St., Lockport, N. Y.

Union Cinch—See Richardson-Phenix Co.

Walworth Mfg. Co., Boston, Mass.

Ware Coupling & Nipple Co., Ware, Mass.

Western Brass Mfg. Works, Marshall Blvd., 21st St. & C., B. & Q. R. R., Chicago, Ill.

Williams Valve Co., D. T., Spring Grove Ave. & Township St., Cincinnati, O.

FITTINGS, SOLDERLESS — See Unions, Tubing

FITTINGS and FIXTURES, Top

(See also Bows, Top; also Fasteners, Curtain; also Irons, Slat; also Irons, Top; also Rests, Bow; also Separators, Bow; also Sockets, Bow; also Straps, Top)

Amesbury Brass & Foundry Co., Amesbury, Mass.

Douglas & Lomason Co., 642 Lincoln Ave., Detroit, Mich.

English & Mersick Co., New Haven, Conn. (See page 573.)

Imperial Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill. (See page 733.)

Metal Stamping Co., 18th St. & Boulevard, Long Island City, N. Y.

Monarch Carriage Goods Co., 2838-44 Spring Grove Ave., Cincinnati, O.

Smith & Co., Jos. N., E. Grand Blvd. & Dubois St., Detroit, Mich.

Western Brass Mfg. Works, Marshall Blvd., 21st St. & C., B. & Q. R. R., Chicago, Ill.

FLAG HOLDERS—See Holders, Flag, Pennant and Emblem

FLAGS, PENNANTS and EMBLEMS

(See also Ornaments, Radiator; for Flag Holders—See Holders, Flag)

American Art Production Co., 141 Wooster St., New York, N. Y.

Bloom Bros. Co., 422-30 First Ave., N., Minneapolis, Minn.

Chicago Pennant Co., 1224 E. 63d St., Chicago, Ill.

Freydberg, G. H. & E., 160 Fifth Ave., New York, N. Y.

Howe Mfg. Co., Chicago, Ill.

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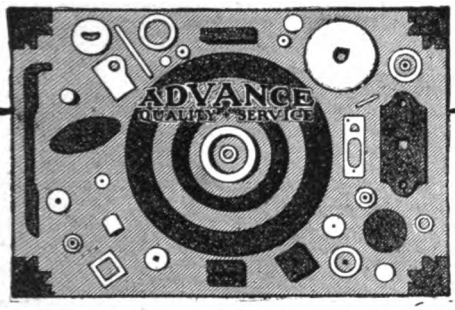

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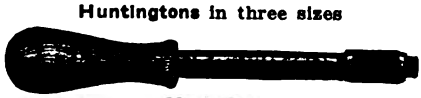

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Kosmos-Art Co., 120 E. Sixth St., Cincinnati, O.
Luxemoor Co., 114 E. 13th St., New York, N. Y.
Massari Co., H. W., 209 S. State St., Chicago, Ill.
Meller & Son, J. B., Dayton, O.
Orcutt & Co., J. C., 134 S. 13th St., Lincoln, Neb.
Staats & Co., E. G., Mt. Pleasant, Ia.

FLANGE COUPLINGS, MOTOR BOAT—See Couplings, Motor Boat Flange

FLANGES, AIRCRAFT PROPELLER HUB—See Hubs, Aircraft Propeller

FLANGES, Pressed Steel Hub

(For Forged or Cast Flanges—See Forgings; also, Castings)

Bossert Corp., Utica, N. Y. (See page 363.)
Buffalo Pressed Steel Co., Buffalo, N. Y. (See page 473.)
Crosby Co., Buffalo, N. Y. (See page 669.)
Federal Pressed Steel Co., Keefe Ave. & N. Pierce St., Milwaukee, Wis.
Gier Pressed Steel Co., Lansing, Mich. (See page 505.)
Ireland & Matthews Mfg. Co., Beard & Chatfield Sts., Detroit, Mich.
Kelsey Wheel Co., Detroit, Mich. (See page 355.)
Konigslow Mfg. Co., Otto E., 3701 Perkins Ave., Cleveland, O.
Savage Arms Corp., Sharon, Pa. (See page 213.)
Worcester Pressed Steel Co., Worcester, Mass

FLASH BOILERS—See Boilers

FLASHLIGHTS, ELECTRIC—See Lights, Electric Flash

FLAT BELTS—See Belting, Leather

FLEXIBLE CONDUIT—See Conduit, Flexible Car Wiring

FLEXIBLE COUPLINGS, MOTOR BOAT—See Couplings, Motor Boat Flexible

FLEXIBLE LEATHER MOULDING—See Moulding, Flexible Leather

FLEXIBLE METAL HOSE—See Tubing, Flexible Metallic; also Hose, Metal Lined

FLEXIBLE SHAFTS—See Shafting, Flexible

FLEXIBLE TUBING—See Tubing, Flexible

FLOATS, Cork

(For Carburetors, Oil and Gasoline Gages, etc.; see also Floats, Metal)

Armstrong Cork Co., 133 23d St., Pittsburgh Pa.
Diamond Cork Co., 59 Pearl St., New York, N. Y.
Mundet & Son, L., King, Ferris & Sullivan Sts., Brooklyn, N. Y.
Paddock Cork Co., 1209-17 DeKalb Ave., Brooklyn, N. Y. (See page 325.)
Spanish-American Cork Co., 2211 Pennsylvania Ave., Baltimore, Md.

FLOATS, Metal

(For Carburetors, Oil and Gasoline Gages, etc.; see also Floats, Cork)

Fitzgerald Mfg. Co., Torrington, Conn. (See page 309.)
Goodnow & Blake Mfg. Co., Fourth & Porter Sts., Detroit, Mich.
Imperial Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill. (See page 733.)
Naugatuck Mfg. Co., Naugatuck, Conn.

FLOOR BOARD MATS FOR FORDS—See Mats, Floor Board

FLOOR MATS—See Carpet, Coach; also Linoleum; also Mats, Rubber

FLOWER VASES—See Holders, Bouquet

FLUX, BRAZING—See Compounds, Brazing

FLUX, Soldering

(For self fusing solder—See Solder, Bar and Wire)

Aero-Flux—See Reade Mfg. Co.
Allen Co., L. B., 4522 N. Lincoln St., Chicago, Ill. "Sun," "Sampson."
Alumalux Co., Sidney, O. "Rajah."
Benson Co., Alex. R., Hudson, N. Y. "Yagers."
Blake Signal & Mfg. Co., 251 Causeway St., Boston, Mass. (See page 721.)
Brunner Chemical Works, 217 E. Third St., Cincinnati, O. "Queen."
Burnley Battery & Mfg. Co., North East, Pa.
Callahan & Co., Geo., 218 Front St., New York, N. Y.
Chicago Solder Co., Chicago, Ill. "Keater." (See page 625.)
Corliss Supply Co., 1906 Olive St., St. Louis, Mo.
Crescent—See McGill Mfg. Co.
Dielectric Mfg. Co., 224 S. Vandeventer Ave., St. Louis, Mo.
Dunton Co., M. W., 150-52 Niagara St., Providence, R. I. "Nokorode."
Durkee-Atwood Co., Minneapolis, Minn. "Rie-Nie."
Echo Motor Co., Tonawanda, N. Y.
Emenar Co., 44 E. 23d St., New York, N. Y. "Solderall."
Eureka—See Grasselli Chemical Co.
Ferro-Brazing Paste Co., 1423 Farragut Ave., Chicago, Ill.
Grasselli Chemical Co., 347 Fifth Ave., New York, N. Y. "Standard," "Eureka."
Hall-Thompson Co., Hartford, Conn. "Wonder Worker." (See page 739.)
Hess & Son, 1304 Filbert St., Philadelphia, Pa. "Tinol."
Illinois Smelting & Refining Co., 408 N. Peoria St., Chicago, Ill. "Peerless." (See page 525.)
Incomparable—See Reade Mfg. Co.
Kalbfleisch Corp., 31 Union Sq., W., New York, N. Y. (See page 87.)
Keater—See Chicago Solder Co.
Krembs & Co., 173 N. Green St., Chicago, Ill.
McGill Mfg. Co., 259 Indiana Ave., Valparaiso, Ind. "Crescent," "Star."
Milmore Corp., Citizens National Bank Bldg., South Bend, Ind.
Nokorode—See Dunton Co.

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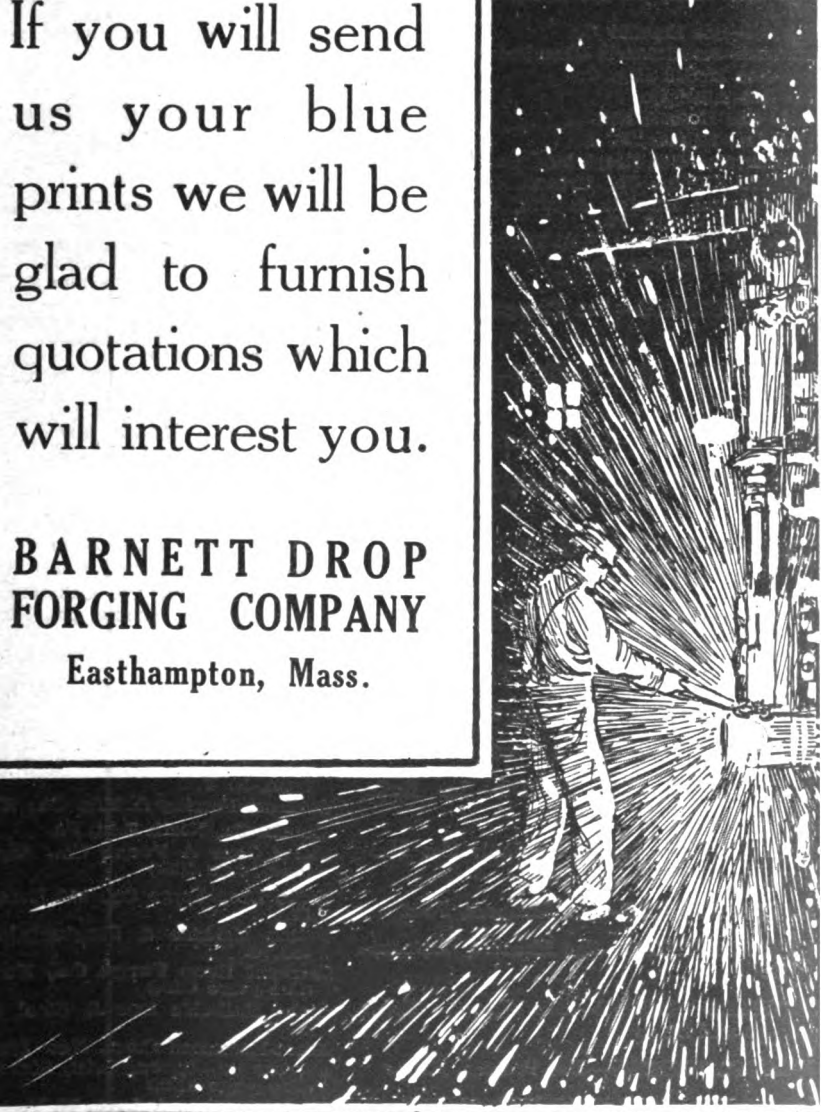

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FLUX, Soldering (Continued)

Northwestern Chemical Co., 610 State St., Marietta, O. "Norwesco." (See page 205.)
Norwesco—See Northwestern Chemical Co.
Peerless—See Illinois Smelting & Refining Co.
Queen—See Brunner Chemical Works.
Rajah—See Alumalux Co.
Reade Mfg. Co., 1021-27 Grand St., Hoboken, N. J. "Incomparable," "Readeana," "Aero-Flux."
Readeana—See Reade Mfg. Co.
Red Letter—See Ruby Chemical Co.
Reeps Mfg. Co., 50 Church St., New York, N. Y. "20th Century."
Rie-Nie—See Durkee-Atwood Co.
Ruby Chemical Co., 157 W. State St., Columbus, O. "Red Letter."
Sampson—See Allen Co.
Schneider, Emil, 298-306 South St., Newark, N. J.
Solderall—See Emenar Co.
Standard—See Grasselli Chemical Co.
Star—See McGill Mfg. Co.
Sun—See Allen Co.
Tinol—See Hess & Son.
Triad Co., Belmar, N. J.
20th Century—See Reeps Mfg. Co.
Universal Fluxine Co., Urbana, O.
Westinghouse Electric & Mfg. Co. (E. Liberty), Pittsburgh, Pa.
Wonder Worker—See Hall-Thompson Co.
Yagers—See Benson Co.

FLUX, WELDING—See Compounds, Welding

FLY WHEEL BALANCERS—See Ways, Balancing

FOLDING PAILS—See Buckets, Collapsible

FOLDING STEPS—See Steps, Special Folding

FOOT ACCELERATORS—See Pedals, Special Accelerator

FOOT ACCELERATORS FOR FORDS—See Accelerators, Foot

FOOT PUMPS—See Pumps, Foot Tire

FOOT PUSHES—See Pushes, Foot

FOOT RAILS—See Rests, Foot

FOOT RAILS FOR FORDS—See Rails, Foot

FOOT RESTS—See Rests, Foot; also Hassocks, Automobile

FOOT SCRAPERS—See Scrapers, Foot

FOOT WARMERS—See Heaters, Automobile

FOOTMAN LOOPS—See Loops, Brass Snap and Strap

FORCING PRESSES—See Presses, Arbor

FORE-DOOR VENTILATORS—See Ventilators, Limousine and Fore-Door

FORGINGS, Drop

Accessory Forgings Co., 1440 Orleans St., Detroit, Mich.
Ajax Forge Co., 2503 Blue Island Ave., Chicago, Ill.
Allison & Co., Chester, Pa. (See page 597.)
American Forge & Machine Co., 1425 Barth Ct., Canton, O.
American Forging & Socket Co., Pontiac, Mich.
American Forgings Co., 2700-98 N. 24th St., Birmingham, Ala.
Anderson Forge & Machine Co., Detroit, Mich. (See page 291.)
Atlas Drop Forge Co., Lansing, Mich.
Atwater Mfg. Co., Plantsville, Conn.
Baker Gun & Forging Co., Batavia, N. Y. (See page 325.)
Barnett Drop Forging Co., East Hampton, Mass. (See page 289.)
Belden Machine Co., Whalley Ave. & Tryon St., New Haven, Conn.
Bethlehem Steel Co., Third & Poplar Sts., South Bethlehem, Pa.
Billings & Spencer Co., Laurel & Park Sts., Hartford, Conn.
Blakeslee Forging Co., Plantsville, Conn.
Bonney Vise & Tool Works, Allentown, Pa. (See page 293.)
Brewer-Titchener Corp., 115 Port Watson St., Cortland, N. Y.
Buffalo Drop Forge Co., 53-59 Carroll St., Buffalo, N. Y.
Canton Drop Forging & Mfg. Co., Canton, O. (See page 293.)
Cape Ann Tool Co., Granite St., Pigeon Cove, Mass.
Champion Machine & Forging Co., 3725 E. 78th St., Cleveland, O. (See page 429.)
Clapp Mfg. Co., E. D., 305 W. Genesee St., Auburn, N. Y.
Cleveland City Forge & Iron Co., Hamilton & E. 45th Sts., Cleveland, O.
Cleveland Hardware Co., 4500 Hamilton Ave., Cleveland, O.
Columbus Bolt Works Co., Columbus, O. (See page 187.)
Columbus Forge & Iron Co., Columbus, O. (See page 293.)
Consolidated Mfg. Co., Toledo, O.
Crescent Forgings Co., Oakmont, Pa.
Davis Sewing Machine Co., Linden & Davis Sts., Dayton, O.
Dean Forging Co., 1825 E. Jackson St., Muncie, Ind.
Detroit Forging Co., 120 Mt. Elliott St., Detroit, Mich.
Drop Forging Co. of New York, 297 West Side Ave., Jersey City, N. J.
Eccles Co., Richard, 1-7 S. Division St., Auburn, N. Y.
Endicott Forging & Mfg. Co., Endicott, N. Y.
Eureka Co., North East, Pa.
Frost Gear & Forge Co., Jackson, Mich. (See page 485.)
Fruin Drop Forge Co., 347 Root St., Chicago, Ill.
Fulton Machine & Forging Co., Canal Fulton, O.
General Drop Forge Co., Buffalo, N. Y. (See page 349.)
Globe Malleable Iron & Steel Co., Syracuse, N. Y.
Grant-Hammond Corp., New Haven, Conn.
Harley Co., Springfield, Mass. (See page 185.)
Henry & Allen, Auburn, N. Y.
Herbrand Co., Fremont, O.

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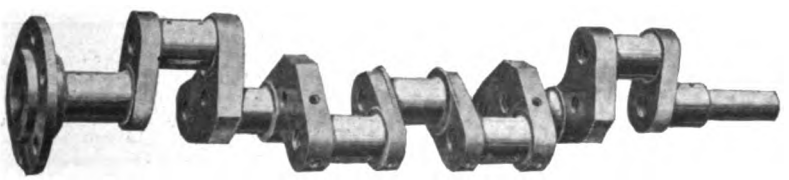

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FORGINGS, Drop (Continued)

Indianapolis Drop Forging Co., Madison Ave. & Dowling St., Indianapolis, Ind.

Infuso—See Steel Improvement & Forge Co.

Ingalls-Shepard Forging Co., 147th St. & Page Ave., Harvey, Ill.

Keystone Forging Co., Duke & Front Sts., Northumberland, Pa.

Kilborn & Bishop Co., Chapel & Lloyd Sts., New Haven, Conn.

Kropp Forge Co., 2508-22 W. 21st St., Chicago, Ill.

Ladish Drop Forge Co., Cudahy, Wis. (See page 333.)

Lakeside Forge Co., Erie, Pa. (See page 755.)

Lawrie Co., Fred'k S., Odd Fellows Bldg., Indianapolis, Ind. (Sales Agents.) (See page 867.)

McDougall & Potter Co., 606 W. 55th St., New York, N. Y.

McKay Co., James, McKees Rocks, Pa. "Quality."

Machinery Forging Co., Hamilton & Marquette Sts., Cleveland, O.

Martin Forging Co., H. J., 510 Harding St., Indianapolis, Ind.

Merrill Bros., 3 Arnold St., Maspeth, N. Y.

Michigan Bolt & Nut Works, ft. Meldrum Ave., Detroit, Mich.

Michigan Drop Forge Co., S. Saginaw St., Pontiac, Mich.

Milwaukee Forge & Machine Co., 340 Oklahoma Ave., Milwaukee, Wis.

Moore Drop Forging Co., Birnie Ave. & Walter St., Springfield, Mass.

New England Forge Co., 9 Plymouth St., Worcester, Mass.

O. K. Tool Holder Co., Shelton, Conn.

Obenberger Forge Co., John, West Allis, Wis. (See page 411.)

Ohio Forge Co., Cleveland, O. (See page 731.)

Oliver Iron & Steel Co., Pittsburgh, Pa.

Pan Motor Co., St. Cloud, Minn.

Park Drop Forge Co., Cleveland, O. (See page 235.)

Pittsburgh Knife & Forge Co., Pittsburgh, Pa.

Portland Forge & Foundry Co., Portland, Ind.

Quality—See McKay Co.

Queen City Forging Co., Cincinnati, O.

Revere Drop Forge Co., Revere, Mass.

Richmond Forging Corp. (Acca Station), Richmond, Va.

Rivetless Chain & Engineering Co., Avon, Pa.

Rockford Drop Forge Co., Rockford, Ill. (See page 293.)

Savage Arms Corp., Sharon, Pa. (See page 213.)

Scherer & Co., H., 280 Jefferson Ave., E., Detroit, Mich.

Smith Corp., A. O., Milwaukee, Wis. (See page 343.)

Smith & Co., H. D., Plantville, Conn.

Spicer Mfg. Corp., South Plainfield, N. J. (See page 501.)

Standard Parts Co., Cleveland, O. (See pages 408 and 409.)

Steel Improvement & Forge Co., 5003 Windsor Ave., Cleveland, O. "Infuso."

Strieby & Foote Co., 301 Ogden St., Newark, N. J.

Sundberg Co., Kinzie & Carpenter Sts., Chicago, Ill.

Transue & Williams Steel Forging Corp., 580 W. Ely St., Alliance, O. (See page 571.)

Union Drop Forge Co., 358 W. Indiana St., Chicago, Ill.

Union Forging Co., Union, N. Y. (See page 187.)

Union Switch & Signal Co., Swissvale, Pa.

Western Drop Forge Co., Marion, Ind. (See page 783.)

Western Malleable Steel Co., 1250 Jefferson Ave., W., Detroit, Mich.

Western Tool & Forge Co., Brackenridge, Pa.

Whitman & Barnes Mfg. Co., E. Exchange St., Akron, O.

Wilcox, Crittenden & Co., 83 Main St., Middletown, Conn.

Wilcox Mfg. Co., D., Mechanicsburg, Pa.

Williams & Co., J. H., 38 Richards St., Brooklyn, N. Y. (See page 433.)

Wyman-Gordon Co., Worcester, Mass. (See Back Bone.)

FORMING LATHES—See Lathes, Forming

FORMING MACHINES—See Machines, Louvre, Forming; also Machines, Hood Hinge Forming

FOUNDRY SUPPLIES—See Supplies, Foundry.

FRAME EXTENSIONS FOR FORDS—See Extensions, Dummy Frame

FRAME LINING—See Lining, Body or Frame

FRAME PADDING—See Lining, Body or Frame

FRAMES, Hack Saw

(For Hack Saw Blades—See Blades, Hack Saw)

Atkins & Co., E. C., South & Illinois Sts., Indianapolis, Ind. "Hoosier," "Indiana."

Bridgeport Hardware Mfg. Corp., 461 Iranistan Ave., Bridgeport, Conn.

Buffum Tool Co., Louisiana, Mo. (See page 707.)

Crown—See Union Hardware Co.

Diamond Saw & Stamping Works, 357-61 Seventh St., Buffalo, N. Y. "Sterling."

Dikeman Mfg. Co., Merwin St., Norwalk, Conn.

Disston & Sons, Henry, (Tacony), Philadelphia, Pa. "Eagle," "Keystone."

Eagle—See Disston & Sons.

Eagle—See Union Hardware Co.

Goodell-Pratt Co., Greenfield, Mass. (See page 751.)

Griffin Co., G. W., Franklin, N. H.

Hoosier—See Atkins & Co.

Indiana—See Atkins & Co.

Jennings & Co., C. E., 71-73 Murray St., New York, N. Y.

Keystone—See Disston & Sons.

Langelier Mfg. Co., 67 Clifford St., Providence, R. I.

Master Grip—See Thompson & Son Co.

Milford—See Thompson & Son Co.

Millers Falls Co., Millers Falls, Mass. "Star."

Napier Saw Works, 40 Napier St., Springfield, Mass.

Red Devil—See Smith & Hemenway.

S. & I. Co., 55-57 Governor St., Springfield, Mass.

Simonds Mfg. Co., North St., Fitchburg, Mass.

Smith & Hemenway, 130 Colt St., Irvington, N. J. "Red Devil."

Star—See Millers Falls Co.

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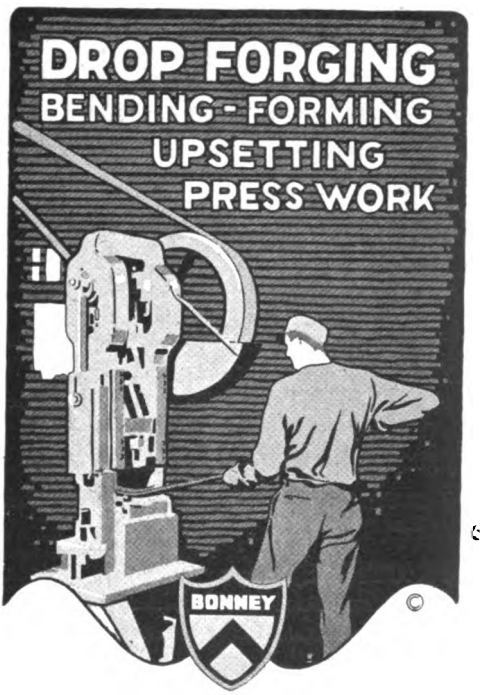

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FRAMES, Hack Saw (Continued)

Starrett Co., L. S., Athol, Mass.
Sterling—See Diamond Saw & Stamping Works.
Thompson & Son Co., Henry G., 492 State St., New Haven, Conn. "Milford," "Master Grip."
Union Hardware Co., Torrington, Conn. "Crown," "Eagle."
Union Tool Co., Orange, Mass.
Universal—See West Haven Mfg. Co.
Utility—See West Haven Mfg. Co.
Victor Saw Works, Rowland Ave., Springfield, Mass.
West Haven Mfg. Co., 22 Elm St. (West Haven), New Haven, Conn. "Utility," "Universal."

FRAMES, Pressed Steel

Detroit Pressed Steel Co., Detroit, Mich. "Presteel." (See page 365.)
Forsyth Bros. Co., McCormick Bldg., Chicago, Ill.
Hydraulic Pressed Steel Co., 2180 E. 61st St., Cleveland, O. (See page 297.)
Parish Mfg. Co., Reading, Pa. (See page 541.)
Parish & Bingham Co., Cleveland, O. (See page 295.)
Presteel—See Detroit Pressed Steel Co.
Savage Arms Corp., Sharon, Pa. (See page 213.)
Smith Corp., A. O., Milwaukee, Wis. (See page 343.)

FRAMES, WOOD CUSHION—See Parts, Wood

FRICTION CLUTCHES — See Clutches, Friction

FRICTION DISCS—See Frictions, Fibre

FRICTION LEATHER—See Leather, Friction

FRICTIONS, Fibre

(For use in Friction Transmission)

Divine Bros. Co., 202 Whitesboro St., Utica, N. Y.
Rockwood Mfg. Co., 1900 English Ave., Indianapolis, Ind.

FRONT COMPARTMENT VENTILATORS FOR FORDS—See Ventilators, Dashboard

FRONT WHEEL BEARINGS FOR FORDS —See Bearings, Front Wheel

FUEL ECONOMIZERS—See Mixers, Economizers or Agitators, Fuel

FUEL LEVEL INDICATORS—See Gages, Gasoline Tank

FUEL MIXERS—See Mixers, Economizers or Agitators; also Vaporizers

FUEL PUMPS—See Pumps, Aeroplane Fuel

FUEL REGULATORS — See Regulators, Fuel Feed

FUEL RESERVE COCKS—See Valves, Two Way Tank

FUEL RESERVE COCKS FOR FORDS—See Cocks, Fuel Supply

FUEL SAVERS—See Mixers, Economizers also Strainers, Gasoline

FUEL STRAINERS—See Funnels, Gasoline; or Agitators

FUNNELS and MEASURES, Metal

(For Garage use for Gasoline or Oil)

Atlantic Stamping Co., 180 Ames St., Rochester, N. Y.
Best, R. L., Bismarck, N. Dak.
Bradbury & Hoyt, 1024 N. Hoover St., Los Angeles, Cal. "Swingspout."
Central Stamping Co., 172-74 Fulton St., New York, N. Y. "Puritan."
Dover Stamping & Mfg. Co., 385 Putnam Ave., Cambridge, Mass. "Saval," "Kompact."
Entorp Filter Co., Amboy, Ill.
Hoaglin Mfg. Co., F. L., 200 N. Main St., Waupaca, Wis. "Nospil."
Kompact—See Dover Stamping & Mfg. Co.
Kraft, A. C., 323-25 W. Lake St., Chicago, Ill.
Lawson Co., F. H., Dept. D., Cincinnati, O. (See page 663.)
National Enameling & Stamping Co., 413 Fifth Ave., New York, N. Y.
Nospil—See Hoaglin Mfg. Co.
Puritan—See Central Stamping Co.
Puritan—See Sexton Can Co.
Saval—See Dover Stamping & Mfg. Co.
Schuyler Mfg. Co., W. S., 607 W. Main St., Savannah, Mo.
Sexton Can Co., 228 Franklin St., Boston, Mass. "Puritan."
Swingspout—See Bradbury & Hoyt.
Vogel & Bros., Wm., 433 Kent Ave., Brooklyn, N. Y.
Weber Bros. Metal Works, 108-38 N. Jefferson St., Chicago, Ill.

FUR BOOTS—See Boots, Motorists'

FUR COATS—See Clothing, Motorists'

FUR GLOVES—See Gloves, Motorists'

FURNACES, Annealing and Case Hardening

American Gas Furnace Co., 24 John St., New York, N. Y. (See page 721.)
Bellevue Industrial Furnace Co., 703-11 Bellevue Ave., Detroit, Mich.
Best, W. N., 11 Broadway, New York, N. Y.
Brown & Sharpe Mfg. Co., Promenade St., Providence, R. I.
Buckeye—See Macleod Co.
Capital Die, Tool & Machine Co., 619-21 N. Fourth St., Columbus, O.
Chicago Flexible Shaft Co., 608 La Salle St., Chicago, Ill. "Stewart."
Gantt—See Witteman Co.
Gilbert & Barker Mfg. Co., Cold Springs Ave., (West Springfield), Springfield, Mass.
Hauck Mfg. Co., 140 Livingston St., Brooklyn, N. Y.
Johnson Gas Appliance Co., 520 E Ave., West, Cedar Rapids, Ia.
Macleod Co., 2232 Bogen St., Cincinnati, O. "Buckeye."

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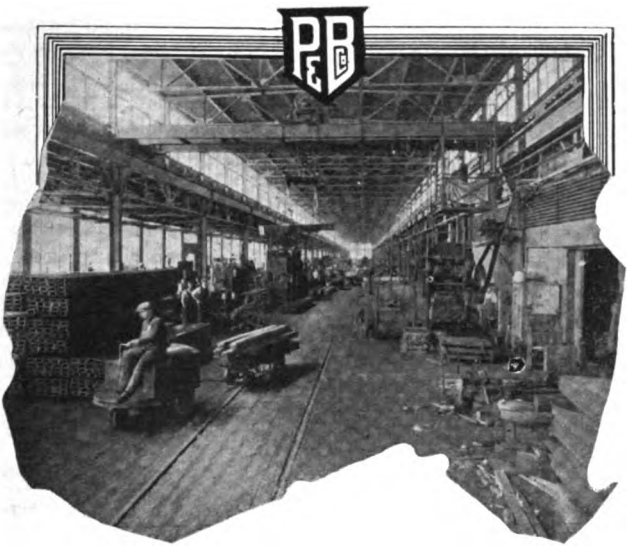

No. 2 Bay of Main Building, containing large presses, 5-ton overhead cranes, electric truck for transporting material to furnaces, welding dept., etc. Note railroad tracks entering building, making it possible to load material right into the cars.

Frames for Farm Tractors

Since the manufacture of tractor parts is a new field for most of the automotive industry, it is advisable that you select for the manufacture of your tractor frames those firms which have shown unusual engineering ability and enterprise.

In this way you can avoid disappointments and delays.

The Parish & Bingham Company with its 14 years' experience in making frames for automotive vehicles, with its immense plant and competent engineering force, is the logical firm to design and build your tractor frames.

Send us the details of your tractor and we can give you a definite idea of just what Parish & Bingham service can accomplish for you.

THE PARISH & BINGHAM COMPANY
Cleveland Ohio

F R A M E S

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FURNACES, Annealing and Case Hardening (Continued)

Rockwell Co., W. S., 50 Church St., New York, N. Y.
Scott, C. U., Second & Wall Sts., Davenport, Ia.
Stewart—See Chicago Flexible Shaft Co.
Tate-Jones & Co., Empire Bldg., Pittsburgh, Pa.
Whiting Foundry Equipment Co., Harvey, Ill.

FURNACES, Babbitt Melting

American Gas Furnace Co., 24 John St., New York, N. Y. (See page 721.)
Buzzer—See Hones, Charles A.
Chicago Flexible Shaft Co., 608 La Salle St., Chicago, Ill. "Stewart."
Davis Machine Tool Co., Rochester, N. Y. "Vesuvius."
Hauck Mfg. Co., 140 Livingston St., Brooklyn, N. Y.
Hones, Charles A., Noble & Franklin Sts., Brooklyn, N. Y. "Buzzer." (See page 297.)
Johnson Gas Appliance Co., 520 E Ave., West, Cedar Rapids, Ia.
Stewart—See Chicago Flexible Shaft Co.
Vesuvius—See Davis Machine Tool Co.

FURNACES, Brass and Copper Melting

Barnett Foundry Co., Oscar, Lyons Ave. & Coit St., Irvington, N. J.
Best, W. N., 11 Broadway, New York, N. Y.
Brass Founders Supply Co., Hamburg Pl. nr. Ave. L, Newark, N. J.
Calumet Foundry Equipment Co., Harvey, Ill.
Chicago Flexible Shaft Co., 608 La Salle St., Chicago, Ill. "Stewart."
Fisher, Alfred, 1447-55 Austin Ave., N., Chicago, Ill.
Hauck Mfg. Co., 140 Livingston St., Brooklyn, N. Y.
Johnson Gas Appliance Co., 520 E Ave., West, Cedar Rapids, Ia.
Kroeschell Bros. Co., 444 W. Erie St., Chicago, Ill. "Kroeschell-Schwartz."
Kroeschell-Schwartz—See Kroeschell Bros. Co
M. R. V.—See Wise, J. B.
Monarch Engineering & Mfg. Co., American Bldg., Baltimore, Md. "Steele-Harvey."
Rockwell Co., W. S., 50 Church St., New York, N. Y.
Steele-Harvey—See Monarch Engineering & Mfg. Co.
Stevens, Frederic B., Detroit, Mich. (See page 776.)
Stewart—See Chicago Flexible Shaft Co.
Whiting Foundry Equipment Co., Harvey, Ill
Wise, J. B., Watertown, N. Y. "M. R. V."

FURNACES, CASE HARDENING — See Furnaces, Annealing

FURNACES, COPPER MELTING—See Furnaces, Brass and Copper Melting

FURNACES, GASOLINE — See Torches, Gasoline

FURNACES, Soldering

(See also Torches, Gasoline)

Buzzer—See Hones, Charles A.
Hones, Charles A., Noble & Franklin Sts., Brooklyn, N. Y. "Buzzer." (See page 297.)

FUSELAGE WIRE PROTECTORS, AEROPLANE — See Protectors, Aeroplane Rubber Fuselage Wire

FUSES, Electric

Buss—See Bussmann Mfg. Co.
Bussmann Mfg. Co., 3819-25 N. 23d St., St. Louis, Mo. "Buss." (See page 299.)
Chicago Fuse Mfg. Co., Chicago, Ill. "Union." (See page 305.)
D. & W. Fuse Co., Providence, R. I.
Electric Fuseguard Co., 60 Shipman St., Newark, N. J.
General Electric Co., Schenectady, N. Y. (See pages 564 and 565.)
Johns-Manville Co., H. W., Madison Ave. & 41st St., New York, N. Y.
Killark Electric Co., 22d & Washington Ave., St. Louis, Mo.
Oettinger Corp., F. W., 25 Vanderbilt Ave., New York, N. Y. "Tower." (See page 305.)
Tower—See Oettinger Corp.
Union—See Chicago Fuse Mfg. Co.
Westinghouse Electric & Mfg. Co. (E. Liberty), Pittsburgh, Pa. (See page 667.)

GAGE GLASS REFLECTORS—See Mirrors, Water Gage

GAGE GLASSES—See Glasses, Gage and Lubricator

GAGE LAMPS—See Lamps, Electric Dash

GAGES, AIR — See Gages, Steam; also Gages, Tire

GAGES, Aircraft Gasoline

Boston Auto Gage Co., 8 Waltham St., Boston, Mass. (See page 305.)

GAGES, ALIGNING — See Gages, Wheel Aligning

GAGES, Battery

(Pocket and Dash Board Battery Testers. For Standard Instruments—See Ammeters)

Advance—See Eldredge Electric Mfg. Co.
American Ever Ready Works, Thomson Ave & Orton St., Long Island City, N. Y. "Eveready."
Ballman-Whitten Mfg. Co., 4440 Olive St., St. Louis, Mo.
Cemco—See Clark Electric Meter Co.
Clark Electric Meter Co., 1330 12th St., Detroit, Mich. "Cemco."
Connecticut Telephone & Electric Co., Meriden, Conn. (See pages 676 and 677.)
Dow Mfg. Co., 131 Adams St., Braintree, Mass.
Eclipse—See Eldredge Electric Mfg. Co.
Elco—See Eldredge Electric Mfg. Co.
Eldredge Electric Mfg. Co., 7 Post Office Sq., Springfield, Mass. "Advance," "Elco," "Eclipse," "Midget."
Eveready—See American Ever Ready Works.
Gray-Heath Co., 1440 S. Michigan Ave., Chicago, Ill. (Sole Distributors for Jewell Electrical Instrument Co., Chicago, Ill.) (See Inside Back Cover.)
Gray & Davis, Boston, Mass. (See page 651.)
Harvard Electric Co., 525 W. Van Buren St., Chicago, Ill.
Hoyt Electrical Instrument Works, Penacook, N. H. "Utility," "Ultimate." (See page 507.)

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"Hydraulic" Pressed Steel Products are a "Criterion" of Good Workmanship and Material.

"Hydraulic" Automobile Frames are made in the most modern plant in America, by men who have made frames a life study. Just the right materials scientifically treated and combined with our wonderful manufacturing facilities, plus that indispensable "Know-how" result in the product recognized as the standard the world over.

"Hydraulic" Pressed Steel hub-flanges, brake drums, step hangers, torque arms, running boards and miscellaneous heavy stampings are of the same high quality as Hydraulic Frames.

We are well equipped to supply aeroplane and tractor manufacturers with stampings and pressed steel parts.

With over 15 acres of Pressed Steel capacity we feel sure that we can serve you well.

THE HYDRAULIC PRESSED STEEL CO.

3180 EAST 61ST STREET CLEVELAND, U. S. A.

Automatic Blast Furnaces

Will heat a pair of 14 lb. coppers in 7 minutes. Adapted for melting babbitt, tempering, annealing.

"Buzzers—the hottest built without a blower"

Whatever may be your need for a gas soldering furnace the buzzer is the hottest and the quickest heater made without a blower, besides the most economical to operate and maintain. Consumes only 12 cu. ft. of gas per hour per burner.

Write us today for samples for trial. Send for catalog on soldering and melting furnaces, laboratory burners, etc.

CHAS. A. HONES, Inc.
Noble and Franklin Sts., Brooklyn, N. Y.

For Aircraft builders soldering irons and metal can be heated at the same time.

—TIRES—

SOLID
PNEUMATIC—CORD and FABRIC
INNER TUBES

MANUFACTURED BY

JOHNSTONE TIRE & RUBBER CO.

GEN. OFFICES
PEOPLE'S GAS BLDG.
CHICAGO ILL.

FACTORY
LA PORTE, IND.

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GAGES, Battery (Continued)

Jewell Electrical Instrument Co.—See Gray-Heath Co.

Midget—See Eldredge Electric Mfg. Co.

Nagel Electric Co., W. G., 28-32 St. Clair St., Toledo, O.

Pennsylvania Rubber & Supply Co., 1845-47 Euclid Ave., Cleveland, O. "Prsco."

Prsco—See Pennsylvania Rubber & Supply Co.

Readrite Meter Works, 25 College Ave., Bluffton, O.

Reliance Instrument Co., 1125 Van Buren St., Chicago, Ill.

Sholder-Excel Mfg. Co., Clyde, O.

Sterling Mfg. Co., Blackstone Bldg., Cleveland, O. "Trescot."

Teco—See Titan Engineering Co.

Titan Engineering Co., Union City, Ind. "Teco."

Trescot—See Sterling Mfg. Co.

Ultimate—See Hoyt Electrical Instrument Works.

Utility—See Hoyt Electrical Instrument Works.

Wagner Electric Mfg. Co., 6400 Plymouth Ave., St. Louis, Mo.

GAGES, Boiler Water-Line

(For indicating height of water in steam boilers)

Ashton Valve Co., 271 Franklin St., Boston, Mass.

Reliable Water Gauge Co., 1616 Pine St., St. Louis, Mo.

Schaeffer & Budenberg Mfg. Co., Berry & S. Fifth Sts., Brooklyn, N. Y.

Wiltbonco Mfg. Co., 10 Post Office Sq., Boston, Mass.

GAGES, Centre

Athol Machine Co., Athol, Mass.

Brown & Sharpe Mfg. Co., Promenade St., Providence, R. I.

Goodell-Pratt Co., Greenfield, Mass. (See page 751.)

Starrett Co., L. S., Athol, Mass.

Wyke, J., South St., Wilmington, Mass.

GAGES, CIRCULATION — See Gages, Water Circulation

GAGES, Connecting Rod, for Fords

Storm Mfg. Co., Dept. D., Thompson, Ia. (See page 621.)

GAGES, Cylinder Compresion

(For testing compression in gas engine cylinders)

Brown Co., 213 Bellevue Ave., Syracuse, N. Y.

Edelmann & Co., E., 341-63 E. Ohio St., Chicago, Ill.

Foxboro Co., Foxboro, Mass.

Mayo-Skinner Mfg. Co., 2115 Elston Ave., Chicago, Ill. (See page 539.)

United States Gauge Co., New York, N. Y. (See page 301.)

GAGES, Depth

Athol Machine Co., Athol, Mass.

Brown & Sharpe Mfg. Co., Promenade St., Providence, R. I.

Goodell-Pratt Co., Greenfield, Mass. (See page 751.)

Starrett Co., L. S., Athol, Mass.

GAGES, Drill and Wire

Blodgett Mfg. Co., 248 Penn St., Rochester, N. Y.

Brown & Sharpe Mfg. Co., Promenade St., Providence, R. I.

Detroit Twist Drill Co., Detroit, Mich. (See page 259.)

Morse Twist Drill & Machine Co., New Bedford, Mass.

Peck, Stow & Wilcox Co., Southington, Conn. "Pexto."

Pexto—See Peck, Stow & Wilcox Co.

Pratt & Whitney Co., 111 Broadway, New York, N. Y. (See page 73.)

Starrett Co., L. S., Athol, Mass.

GAGES, Gasoline Tank

(For indicating amount of gasoline in fuel tanks)

Akron-Selle Co., High & Chestnut Sts., Akron, O. "Tanner."

Boston Auto Gage Co., 8 Waltham St., Boston, Mass. "Triumph," "Challenge." (See page 305.)

Challenge—See Boston Auto Gage Co.

Cole—See Halewick Mfg. Co.

Commonwealth Brass Corp., Commonwealth Ave. & Grand Trunk Ry., Detroit, Mich.

Gasograph—See New Standard Adding Machine Co.

Gem Stamped Steel Co. (Chelsea Station), Boston, Mass.

Halewick Mfg. Co., 2344 W. Austin Ave., Chicago, Ill. "Cole." (See page 305.)

Imperial Fluid Gauge Co., Third St. & Rex Ave., S. E., Canton, O.

Nagel Electric Co., W. G., 28-32 St. Clair St., Toledo, O.

National Motor Supply Co., Painesville, O.

New Standard Adding Machine Co., 3705 Forest Park Blvd., St. Louis, Mo. "Gasograph." (See page 613.)

Rochester Mfg. Co., 39 Halstead St., Rochester, N. Y.

Tanner—See Akron-Selle Co.

Triumph—See Boston Auto Gage Co.

Weiss Mfg. Co., Torrington, Conn.

GAGES, Gasoline Tank, for Fords

(For indicating the amount of gasoline in fuel tanks)

Apex Electric Mfg. Co., 1410 W. 59th St., Chicago, Ill. "Fillometer."

Baer & Glauber, 2041 E. 93rd St., Cleveland, O.

Boston Auto Gage Co., 8 Waltham St., Boston, Mass. "Challenge." (See page 305.)

Buffalo Gauge Co., 336 Hampshire St., Buffalo, N. Y.

Challenge—See Boston Auto Gage Co.

Davenport—See Wheeler-Sheerin Co.

Dependo—See Roper & Co.

Detroit Gasoline Gauge Co., Marquette Bldg., Detroit, Mich.

Fillometer—See Apex Electric Mfg. Co.

Gasograph—See New Standard Adding Machine Co.

Gem Stamped Steel Co. (Chelsea Station) Boston, Mass.

Issaquah Garage, Issaquah, Wash.

Michigan Auto Products Co., Detroit, Mich. "Ospeco." (See page 605.)

National Motor Supply Co., Painesville, O.

New Standard Adding Machine Co., 3705 Forest Park Blvd., St. Louis, Mo. "Gasograph." (See page 613.)

Ospeco—See Michigan Auto Products Co.

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AUTO BUSS FUSES

Made in strict accordance with the specifications of the Society of Automobile Engineers.

Heavy Wall Tubing + Brass Caps nickel plate finish + Special Baking Cement process for fastening caps + Carefully tested fuse element + Rigid Inspection =

THE PERFECT "BUSS" AUTO FUSE

Accurate—Reliable—No Loose Caps

Made in all sizes, styles and types.

GLASS TUBE

FIBRE TUBE

LINK TYPE

	Per Carton of 10	Per Box of 100
No. 1AG, ¼ x ⅝ inch....	$0.30	$2.25
2AG, ½ x 1 3/16 inch	.30	2.25
3AG, ¼ x 1¼ inch..	.30	2.25
4AG, 9/32 x 1¼ inch.	.60	4.50
5AG, 13/32 x 1½ inch	.60	4.50
6AG, 9/16 x 2 inch...	1.20	9.00
No. 4AF, 9/32 x 1¼ inch..	1.08	8.10
5AF, 13/32 x 1½ inch.	1.08	8.10
6AF, 9/16 x 2 inch...	1.50	11.25
Link type	1.08	8.10

(Specify make of car)

When ordering glass or fibre tube fuses, specify amperage desired or make of car

INSIST ON "BUSS" FUSES. If your jobber does not carry them, write us.

To get a complete assorted stock of Auto Fuses at a low cost—buy the

NEW "BUSS" DISPLAY CASE

100 fuse case (17 sizes) $3.37
150 fuse case (18 sizes) 4.95
200 fuse case (18 sizes) 6.30
250 fuse case (18 sizes) 7.65

Has three-color display card with samples mounted thereon and complete list of cars, showing proper fuse to use.

Provides you with a complete stock of auto fuses and a case to stock them in.

Bussmann Mfg. Co. 3819-25 North 23d Street **St. Louis**

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GAGES, Gasoline Tank, for Fords (Continued)

Reeps Mfg. Co., 50 Church St., New York, N. Y.
Rochester Mfg. Co., 39 Halstead St., Rochester, N. Y.
Roper & Co., C. F., Hopedale, Mass. "Dependo."
Stedlor Mfg. Co., Canton, O.
Weiss Mfg. Co., Torrington, Conn.
Wheeler-Sheerin Co., 238 Massachusetts Ave., Indianapolis, Ind. "Davenport."

GAGES, Limit

Brown & Sharpe Mfg. Co., Promenade St., Providence, R. I.
Greenfield Tap & Die Corp., Greenfield, Mass. (See page 687.)
Nichols, W. H., Waltham, Mass.
Pratt & Whitney Co., 111 Broadway, New York, N. Y. (See page 73.)
Rogers Works, John M., ft. Monmouth St., Gloucester City, N. J.
Sloan & Chace Mfg. Co., Sixth Ave. & 13th St., Newark, N. J.
Taft-Peirce, Woonsocket, R. I. (See page 595.)

GAGES, Oil, for Fords

(For indicating the amount of oil in the crank case)

Apco Mfg. Co., Eddy St., Providence, R. I.
Bell Pump & Mfg. Co., 74-78 Fort St., E., Detroit, Mich.
Benford Mfg. Co., Box H., Mt. Vernon, N. Y. "Monarch." (See page 517)
Billinger Mfg. Co, Saranac, Mich.
Bowen Products Corp., Auburn Division, Auburn, N. Y. (See page 237.)
CB—See Cumings Bros.
Cochran Pipe Wrench Mfg. Co., 7545 S. Chicago Ave., Chicago, Ill.
Cumings Bros., Flint, Mich. "CB."
Edelmann & Co., E., 341-63 E. Ohio St., Chicago, Ill.
Evergood—See Grossman Mfg. Corp.
Freeman Brass Works, 92 Bowery, New York, N. Y.
Greer, Fredric, 525 W. Van Buren St., Chicago, Ill.
Grossman Mfg. Corp., Emil, Bush Terminal Bldg. No. 20, Brooklyn, N. Y. "Evergood."
Henkelman Co., Chas. E., 2213-15 Pacific Ave., Atlantic City, N. J.
Hill-Smith Metal Goods Co., Dept. H., Boston, Mass. (See page 221.)
Ideal—See Worthington, A. P.
Illinois Brass Mfg. Co., 226-30 W. Ontario St., Chicago, Ill.
Mosler & Co., A. R., Mt. Vernon, N. Y.
Reeps Mfg. Co., 50 Church St., New York, N. Y.
Vaporator Mfg. Co., 2789 Washington Ave., St. Louis, Mo. (See page 447.)
Whitehouse-LeCompte Mfg. Co., 42-54 Elm St., Newark, N. J.
Worthington, A. P., 700 N. Main St., Los Angeles, Cal. "Ideal."

GAGES, Plug and Ring

Ames & Co., B. C., Waltham, Mass.
Atlas Steel Ball Co., Glenwood Ave. & Fourth St., Philadelphia, Pa.
Brown & Sharpe Mfg. Co., Promenade St., Providence, R. I.
General Tool Co., 1760 Main St., Buffalo, N. Y.
Greenfield Tap & Die Corp., Greenfield, Mass. (See page 687.)
Johansson—See Swedish Gage Co.
Morse Twist Drill & Machine Co., New Bedford, Mass.
Nichols, W. H., Waltham, Mass.
Pratt & Whitney Co., 111 Broadway, New York, N. Y. (See page 73.)
Rogers Works, John M., ft. Monmouth St., Gloucester City, N. J.
Sloan & Chace Mfg. Co., Sixth Ave. & 13th St., Newark, N. J.
Swedish Gage Co., 245 W. 55th St., New York, N. Y. (Importers.) "Johansson."
Taft-Peirce, Woonsocket, R. I. (See page 595.)

GAGES, PRESSURE—See Gages, Steam and Air

GAGES, RING—See Gages, Plug and Ring

GAGES, Screw Pitch

Ames & Co., B. C., Waltham, Mass.
Athol Machine Co., Athol, Mass.
Blodgett Mfg. Co., 248 Penn St., Rochester, N. Y.
Brown & Sharpe Mfg. Co., Promenade St., Providence, R. I.
General Tool Co., 1760 Main St., Buffalo, N. Y.
Goodell-Pratt Co., Greenfield, Mass. (See page 751.)
Greenfield Tap & Die Corp., Greenfield, Mass. (See page 687.)
Nichols, W. H., Waltham, Mass.
Perelstrous & Storms Tool Corp., 42 Broadway, New York, N. Y. (See page 643.)
Pratt & Whitney Co., 111 Broadway, New York, N. Y. (See page 73.)
Reed & Prince Mfg. Co., Duncan Ave., Worcester, Mass.
Starrett Co., L. S. Athol, Mass.
Union Tool Co., Orange, Mass.

GAGES, Steam and Air

(Standard Pressure Gages)

American Steam Gauge & Valve Mfg. Co., 208-20 Camden St., Boston, Mass.
Ashton Valve Co., 271 Franklin St., Boston, Mass.
Belfield Co., H., 435 N. Broad St., Philadelphia, Pa.
Foxboro Co., Foxboro, Mass.
Improved Gauge Mfg. Co., 105 Canal St., Syracuse, N. Y. (See page 323.)
Marsh & Co., Jas. P., 118-24 S. Clinton St., Chicago, Ill.
Mayo-Skinner Mfg. Co., 2115 Elston Ave., Chicago, Ill. (See page 539.)
Schaeffer & Budenberg Mfg. Co., Berry & S. Fifth Sts., Brooklyn, N. Y.
Star Brass Mfg. Co., 108-14 E. Dedham St., Boston, Mass.
United States Gauge Co., New York, N. Y. (See page 301.)

GAGES, Surface

Brown & Sharpe Mfg. Co., Promenade St., Providence, R. I.
Goodell-Pratt Co., Greenfield, Mass. (See page 751.)
Pratt & Whitney Co., 111 Broadway, New York, N. Y. (See page 73.)
Starrett Co., L. S., Athol, Mass.
Wyke, J., South St., Wilmington, Mass.

GAGES, Tank—See Gages, Gasoline Tank

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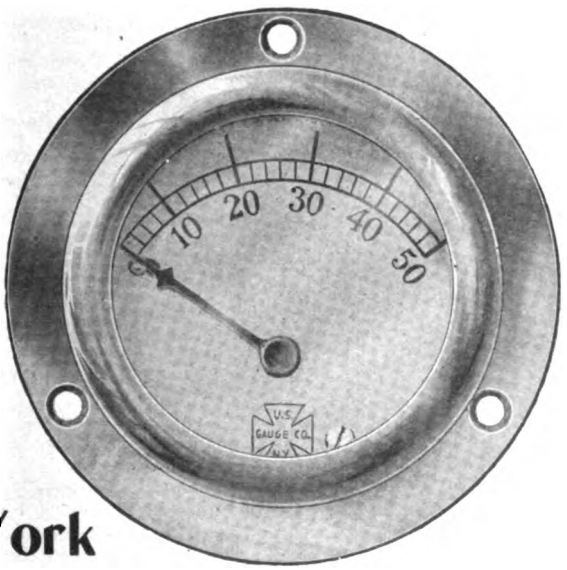
United States Gauge Co.



New York

Chicago

Detroit

If It's a Gauge We Make It

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GAGES, Tire Pressure

(For indicating pressure in tires—See also Valves, Tire Safety)

Allen Auto Specialty Co., 16 W. 61st St., New York, N. Y. "Tyrometer." (See page 229.)
American Sanitary Lock Co., 1072-80 S. East St., Indianapolis, Ind. "Pop-Off."
Barnard Specialty Co., 3300 Maple Ave., Los Angeles, Cal.
Bell Brass Mfg. Co., White Bldg., Seattle, Wash. "Evertite."
Browne Co., 213 Bellevue Ave., Syracuse, N. Y.
Codman & Shurtleff, 120 Boylston St., Boston, Mass.
Edelmann & Co., E., 341-63 E. Ohio St., Chicago, Ill.
Evertite—See Bell Brass Mfg. Co.
Goodrich Co., B. F., S. Main St., Akron, O.
Hansen Mfg. Co., Cleveland, O. (See page 711.)
Hill Pump Valve Co.—See Zinke Co.
Improved Gauge Mfg. Co., 105 Canal St., Syracuse, N. Y. (See page 323.)
Invincible—See United States Gauge Co.
Kellogg Mfg. Co., Rochester, N. Y. (See page 533.)
Mayo-Skinner Mfg. Co., 2115 Elston Ave., Chicago, Ill. (See page 539.)
Noe, Seaman P., Asbury Park, N. J.
Pneu-Meter—See Zinke Co.
Pop-Off—See American Sanitary Lock Co.
Protex Mfg. Co., 13-17 N. Jefferson St., Chicago, Ill. (See page 275.)
Schrader's Son, A., 783-91 Atlantic Ave., Brooklyn, N. Y. (See page 331.)
Shepard Sales Corp., 54 Taylor St., Springfield, Mass. (See page 867.)
Twitchell Gauge Co., 1516 S. Wabash Ave., Chicago, Ill. (See page 303.)
Tyrometer—See Allen Auto Specialty Co.
United States Gauge Co., New York, N. Y. "Invincible." (See page 301.)
Zinke Co., 1323-25 Michigan Ave., Chicago, Ill. (Sole Distributors for Hill Pump Valve Co., Chicago, Ill.) ("Pneu-Meter.") (See page 551.)

GAGES, Vacuum Tank

Jay Corp., Webb, 900 S. Michigan Ave., Chicago, Ill.

GAGES, Water Circulation

(For indicating pressure in water cooling systems)

Ashton Valve Co., 271 Franklin St., Boston, Mass.
Foxboro Co., Foxboro, Mass.
Improved Gauge Mfg. Co., 105 Canal St., Syracuse, N. Y. (See page 323.)
Schaeffer & Budenberg Mfg. Co., Berry & S. Fifth Sts., Brooklyn, N. Y.

GAGES, Wheel Aligning

(For indicating or testing the alignment of front wheels)

International Motor Products Co., 2037 S. Wabash Ave., Chicago, Ill. "Perfection."
Mechanical Utilities Co., 5 N. La Salle St., Chicago, Ill.
Perfection—See International Motor Products Co.

GAGES, WIRE—See Gages, Drill and Wire

GALVANIZING, Sherardizing and Rust-Proofing

American Chain Co., Bridgeport, Conn. (See page 369.)
American Tube & Stamping Co., Bridgeport, Conn.
Bontempi Rust-Proofing Co., 353 Water St., Bridgeport, Conn.
Buffalo Galvanizing & Tinning Works, 49-53 Jackson St., Buffalo, N. Y.
Cleveland Galvanizing Works Co., Cooper Ave. & P. R. R., Cleveland, O.
Cramp & Sons Ship & Engine Bldg. Co., William, Philadelphia, Pa. (See page 453.)
Dover Stamping & Mfg. Co., 335 Putnam Ave., Cambridge, Mass.
Fore River Shipbuilding Corp., Quincy, Mass.
Geuder, Paeschke & Frey Co., 1422-1700 St. Paul Ave., Milwaukee, Wis. (See page 679.)
Globe Machine & Stamping Co., 1250 W. 76th St., Cleveland, O.
Grabler Mfg. Co., Cleveland, O.
Maforco—See Market Forge Co.
Malleable Iron Fittings Co., Branford, Conn.
Market Forge Co., Garvey St. & Blvd., Everett, Mass. "Maforco."
Meaker Galvanizing Co., 1249 Fulton St., Chicago, Ill.
Metal Treating & Equipment Co., 334 Humboldt St., Brooklyn, N. Y.
Mohegan Tube Co., Scott Ave. & Meserole St., Brooklyn, N. Y.
National Galvanizing Co., 1918-26 Carroll Ave., Chicago, Ill.
National Spring Bed Co., New Britain, Conn.
New Haven Sherardizing Co., New Haven, Conn.
Newark Stamping & Foundry Co., Newark, O.
Ohio Sherardizing Co., Whitney Power Blk., Cleveland, O.
Rockford Metal Specialty Co., 720 S. Main St., Rockford, Ill.
Scott, C. U., head of Wall St., Davenport, Ia.
Sherardizing Co. of Illinois, 567 W. Van Buren St., Chicago, Ill.
Stanley Works, New Britain, Conn. (See page 347.)
Union Elevator & Machine Co., 227 W. Erie St., Chicago, Ill.
U. S. Electro-Galvanizing Co., 1-9 Park Ave., Brooklyn, N. Y.
Vail Galvanizing Plant, 209-11 Commercial St., Boston, Mass.
Wise Electro Sherardizing Co., 120 Eighth St., Detroit, Mich. (See page 625.)

GAPS, Spark

(Auxiliary Spark Gaps, Intensifiers or Indicators)

All-Spark—See Alsop Triple Ignition Corp.
Alsop Triple Ignition Corp., 1765 Broadway, New York, N. Y. "All-Spark." (See page 523.)
B. & M. Mfg. Co., 538 Muskego Ave., Milwaukee, Wis.
Bunch & Co., Marshall, Mo. "Gottospark."
Chance Co., Centralia, Mo. "Sparklets."
Gorman Co., J. P., 380-84 Canal St., New York, N. Y. (See page 367.)
Gottospark—See Bunch & Co.
Hartenstein, R. P., 542 S. Dearborn St., Chicago, Ill. "Utility."
Instanto—See Jackson & Co.
Jackson & Co., W., New York Life Bldg., Chicago, Ill. "Instanto."
Jubilee Mfg. Co., 1929 S. 20th St., Omaha, Neb.
Lazarus Mfg. Co., 750-800 Prospect Ave., Cleveland, O. "Lazco."
Lazco—See Lazarus Mfg. Co.
Marvel—See Simpson, William.

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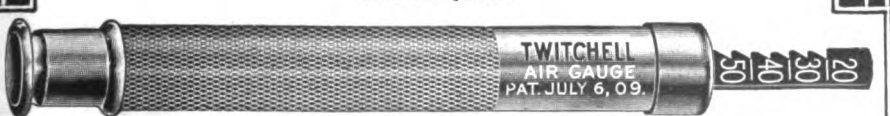

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GAPS, Spark (Continued)

Modern Tool & Stamping Co., 311-17 S. Clinton St., Chicago, Ill.
Pittsburgh Electric Specialties Co., 396 Broadway, New York, N. Y.
Plug Test Co., 738 Broad St., Newark, N. J. "Simplex."
Power Spark Intensifier Co., Watertown, S. Dak.
Pronto Mfg. & Sales Co., 614-15 Paxton Blk., Omaha, Neb.
Rutledge Repair & Engr. Co., Uel Alvin, 1407 E. Tenth St., Charlotte, N. C.
Simplex—See Plug Test Co.
Simpson, William, 228 S. Wells St., Chicago, Ill. "Marvel."
Smith & Gunn, 22-26 E. Broad St., Burlington, N. J.
Sparklets—See Chance Co.
Speco Mfg. Co., 1777 Broadway, New York, N. Y.
Super Spark Co., 756 Woodward Ave., Detroit, Mich.
Utility—See Hartenstein, R. P.
Wetco—See Wetherholt Co.
Wetherholt Co., 20 E. Jackson Blvd., Chicago, Ill. "Wetco."
X-Ray Plug Detector Co., Pleasant Lake, Ind.

GARAGE CANS—See Cans, Gasoline

GARAGE DOOR HANGERS—See Hangers and Hinges, Garage Door

GARAGE DOOR HINGES—See Hangers and Hinges, Garage Door

GARAGE DOOR HOLDERS—See Holders and Openers, Garage Door

GARAGE DOOR OPENERS—See Holders and Openers, Garage Door; also Openers, Electric Garage Door

GARAGE DOORS—See Doors, Special Garage

GARAGE DRAIN TRAPS—See Traps, Garage Floor Drain

GARAGE ELEVATORS — See Elevators, Garage

GARAGE GASOLINE PUMPS—See Tanks, Gasoline Storage

GARAGE HEATERS—See Heaters, Special Garage

GARAGE TIRE PUMPS—See Pumps and Air Compressors

GARAGES, Portable

Aladdin Co., Bay City, Mich.
American Portable House Co., Arcade Bldg., Seattle, Wash.
Anchor Corrugating Construction Co., 140 Washington St., New York, N. Y.
Ashley Steel Building Co., 1790 Broadway, New York, N. Y. "National."
Bossert & Sons, Louis, Grand St. & Newtown Creek, Brooklyn, N. Y.
Brooks-Skinner Co., Quincy Point, Mass.
Burnham-Standeford Co., Washington & First Sts., Oakland, Cal.
Butler Mfg. Co., 1324 Grand Ave., Kansas City, Mo. "Round Ruff."
Canton Metal Ceiling Co., 2100 Harrison Ave., S. W., Canton, O.
Catherman, J. A., Beaver Springs, Pa.
Chesbro-Whitman Co., 1167 First Ave., New York, N. Y.
Columbian Steel Tank Co., 1601-21 W. 12th St., Kansas City, Mo.
Dallery, Geo. W., 129 E. 138th St., New York, N. Y.
Davis-Watson Mfg. Co., 62 Baltimore St., Lynn, Mass.
Diamond Hardware Mfg. Co., 219 Diamond St., Pittsburgh, Pa.
Dougal, W. M., 1410 G St., Washington, D. C.
Ducker Co., 277 Broadway, New York, N. Y.
Duluth Corrugating & Roofing Co., Duluth, Minn.
Eslien Sheet Metal Works, 1001 30th St., Milwaukee, Wis.
Fargo Cornice & Ornament Co., 1002-04 Front St., Fargo, N. Dak. "Rusk."
Farrar Lumber Co., Dalton, Ga.
Fouts Co., C. C., Middletown, O.
Garage Construction Co. of Pittsburgh, Oliver Ave. & Grant St., Pittsburgh, Pa.
Gordon Mfg. Co., Middletown, O.
Gould's All Steel Garage, 37 Adams St., Quincy, Mass.
Harry Steel Co., O. K., 2333-35 Papin St., St. Louis, Mo.
Hoboken Garage Mfg. Co., 74 Bloomfield St., Hoboken, N. J.
Hodgson Co., E. F., 116 Washington St., Boston, Mass. "Wigwam."
Karr Portable House Co., 2554 W. Irving Park Blvd., Chicago, Ill.
Kolb Co., 30 Church St., New York, N. Y.
Manchester Mfg. Co., St. Louis, Mo.
Mecco—See Moeschl-Edwards Corrugating Co.
Mershon & Morley Co., Saginaw, Mich.
Metal Shelter Co., 50 Church St., New York, N. Y. "Pruden."
Miller Mfg. Co., 3000 Alabama Ave., St. Louis, Mo.
Moeschl-Edwards Corrugating Co., Eighth & Ninth Sts., Covington, Ky. "Mecco."
Moister & Co., M., 3931 N. Fifth St., Philadelphia, Pa.
Mower, C. W., Paulsen Bldg., Spokane, Wash.
National—See Ashley Steel Building Co.
Newport Rolling Mill Co., Newport, Ky.
Pinyoun & Son, F. C., 2526 Carnegie Ave., Cleveland, O.
Pruden—See Metal Shelter Co.
Pruden Co., C. D., Warner, Dock & Bayard Sts., Baltimore Md. "Prudential."
Prudential—See Pruden Co.
Riverside Mfg. Co. 162-66 Riverside Ave., Newark, N. J.
Round Ruff—See Butler Mfg. Co.
Rusk—See Fargo Cornice & Ornament Co.
St. Johns Portable Building Co., St. Johns, Mich.
Skinner Co., Thomas, Quincy, Mass.
Steel Fabricating Co., 17th St. & Center Ave., Chicago Heights, Ill. "Stefco."
Stefco—See Steel Fabricating Co.
Taylor Mfg. Co., 219 Glenridge Ave., Montclair, N. J.
Trussed Steel Concrete Co., Youngstown, O.
U. S. Portable Building Co., 115 Broadway, New York, N. Y.
Wigwam—See Hodgson Co.

GAS ANALYSIS INSTRUMENTS—See Instruments, Gas Analysis

GAS BAGS—See Bags, Rubber Gas

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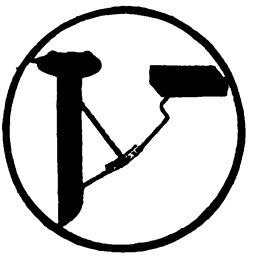

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GAS GENERATORS — See Generators, Acetylene

GAS LAMPS—See Lamps, Acetylene

GAS PLIERS—See Pliers, Combination

GAS PRODUCERS, MOTOR BOAT—See Producers, Motor Boat Gas

GAS PURIFIERS—See Purifiers, Acetylene Gas

GAS TANK KEYS—See Keys, Acetylene

GAS TANKS—See Tanks, Acetylene

GAS TUBING CONNECTIONS—See Connections, Gas Tubing

GASKET CEMENT—See Cement, Gasket

GASKET CUTTERS—See Cutters, Washer or Gasket

GASKETS, ASBESTOS—See Packing, Asbestos

GASKETS, COMPOSITION—See Packing

GASKETS, COPPER—See Gaskets, Metallic

GASKETS, COPPER, FOR FORDS—See Gaskets, Cylinder Head

GASKETS, CORK—See Washers, Cork

GASKETS, Cylinder Head and Valve Cap, for Fords

(Copper—Asbestos Gaskets)

Fitzgerald Mfg. Co., Torrington, Conn. "Never-Leak." (See page 309.)

McCord Mfg. Co., Detroit, Mich. (See pages 558 and 559.)

Never-Leak—See Fitzgerald Mfg. Co.

Victor Mfg. & Gasket Co., Troy & 21st Sts., Chicago, Ill. (See page 307.)

GASKETS, FELT—See Washers, Felt

GASKETS, Felt, for Fords

Advance Felt Specialty & Cutting Co., 315 S. Jefferson St., Chicago, Ill. (See page 287.)

Algco—See Auburn Leather Goods Co.

Auburn Leather Goods Co., 3 Miller St., Auburn, N. Y. "Algco."

Booth Felt Co., 440-50 19th St., Brooklyn, N. Y. (See page 749.)

Brawley, T. R., 85-87 Adams St., Brooklyn, N. Y. "Rounds." (See page 753.)

Rhodes & Co., James H., 157 W. Austin Ave., Chicago, Ill.

Rounds—See Brawley, T. R.

GASKETS, FIBRE—See Fibre, Hard

GASKETS, FIBROUS — See Packing, Asbestos

GASKETS, Metallic

(Copper and Copper-Asbestos)

Faw, J. H., 37 Warren St., New York, N. Y. (Eastern and Southern Distributor for "Never-Leak" Gaskets.) (See page 387.)

Fitzgerald Mfg. Co., Torrington, Conn. "Never-Leak." (See page 309.)

Gasket Supply Co., 1728 Ludlow St., Philadelphia, Pa. (See page 439.)

McCord Mfg. Co., Detroit, Mich. "McKim." (See pages 558 and 559.)

McKim—See McCord Mfg. Co.

Michigan Stamping Co., Mack Ave. & Detroit Terminal, Detroit, Mich.

Never-Leak—See Fitzgerald Mfg. Co.

Phoenix Specialty Mfg. Co., 48-50 Duane St., New York, N. Y.

Right—See Gasket Supply Co.

United States Indestructible Gasket Co., 50 Church St., New York, N. Y.

Victor Mfg. & Gasket Co., Troy & 21st Sts., Chicago, Ill. (See page 307.)

GASKETS, METALLIC, FOR FORDS—See Gaskets, Cylinder Head

GASKETS, RUBBER—See Packing, Rubber

GASKETS, VALVE CAP—See Gaskets, Metallic

GASKETS, VALVE CAP, FOR FORDS—See Gaskets, Cylinder Head

GASOLINE, Automobile

Buck & Co., E. A., Worcester, Mass. "Powero."

Crew-Levick Co., 111 N. Broad St., Philadelphia, Pa.

Emco—See Emery Mfg. Co.

Emery Mfg. Co., Bradford, Pa. "Emco."

Energine Refining & Mfg. Co., The Arcade, Cleveland, O.

Gulf Refining Co., Frick Annex, Pittsburgh, Pa.

National Refining Co., Rose Bldg., Cleveland, O. "White Rose."

Petroleum Products Co., 39th St. & B. & O. R. R., Pittsburgh, Pa. "Vigorite."

Powero—See Buck & Co.

Pure Oil Co., Fifth & Chestnut Sts., Philadelphia, Pa.

Riverside Oil Co., Benedum Trees Bldg., Pittsburgh, Pa.

Socony—See Standard Oil Co. of N. Y.

Standard Oil Co. of N. Y., 26 Broadway, New York, N. Y. "Socony."

Texaco—See Texas Co.

Texas Co., 17 Battery Pl., New York, N. Y. "Texaco."

Tide Water Oil Co., Bowling Green Bldg., New York, N. Y. "Tydol." (See page 487.)

Tiona Refining Co., Madison Ave. & Belt. Ry., Indianapolis, Ind.

Tydol—See Tide Water Oil Co.

Uller, C. C., Tidioute, Pa.

Union Oil Co. of California, San Francisco, Cal

Ventura Mfg. Co., Title Insurance Bldg., Los Angeles, Cal.

Vigorite—See Petroleum Products Co.

Waverly Oil Works Co., Pittsburgh, Pa. (See page 479.)

White Rose—See National Refining Co.

GASOLINE BURNERS—See Burners, Gasoline

GASOLINE CANS—See Cans, Gasoline

GASOLINE CARBURETERS—See Carbureters, Gasoline

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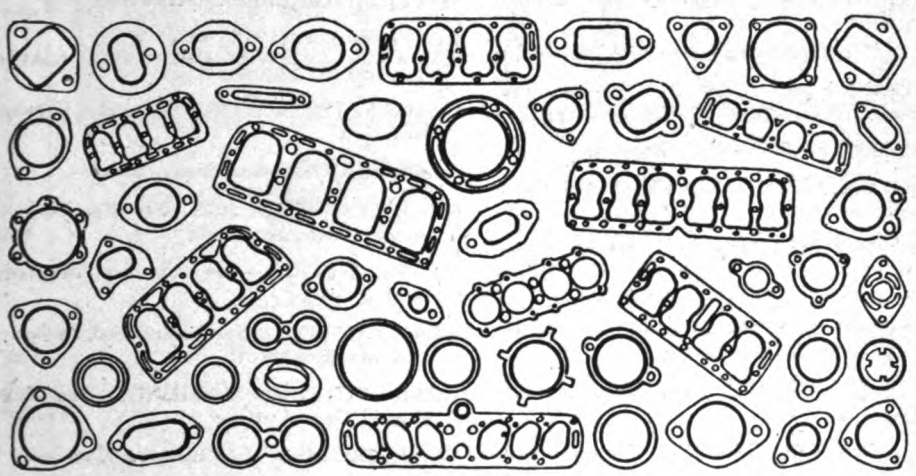

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GASOLINE ENGINE STARTERS — See Starters

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GASOLINE FEED SYSTEMS—See Systems, Magnetic Pump Gasoline; also Tanks, Vacuum

GASOLINE FUNNELS—See Funnels, Metal

GASOLINE FURNACES—See Torches, Gasoline

GASOLINE GAGES—See Gages

GASOLINE LOCK VALVES—See Valves, Gasoline Lock

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GASOLINE RESERVE VALVES FOR FORDS—See Cocks, Fuel Supply

GASOLINE SAVERS—See Mixers, Economizers or Agitators, Fuel

GASOLINE SEPARATORS—See Strainers, Gasoline

GASOLINE STARTERS—See Starters, Vapor Engine

GASOLINE STORAGE SYSTEMS — See Tanks and Systems, Gasoline Storage

GASOLINE STORAGE TANKS — See Tanks and Systems, Gasoline Storage

GASOLINE STRAINERS—See Strainers, Gasoline

GASOLINE SYSTEMS, FEED—See Systems, Magnetic Pump Gasoline; also Tanks, Vacuum

GASOLINE TANK GAGES — See Gages, Gasoline

GASOLINE TANKS—See Tanks, Emergency; also Tanks, Fuel; also Tanks and Systems

GASOLINE TESTERS—See Hydrometers

GASOLINE TORCHES—See Torches, Gasoline

GASOLINE TREATING COMPOUNDS—See Compounds, Gasoline Treating

GATES, Automatic Driveway

Byerly—See Cargill Mfg. Co.
Cargill Mfg. Co., West End of Buttles Ave., Columbus, O. "Byerly."

GAUNTLETS, MOTORISTS'—See Gloves, Motorists'

GEAR BLANKS—See Gears, Blank

GEAR CENTERING JIGS—See Jigs, Speedometer Gear Centering

GEAR CHECKS — See Checks, Steering Gear

GEAR CUTTING—See Gears and Pinions; also Machine Work

GEAR CUTTING MACHINES—See Machines, Gear Cutting

GEAR GREASES—See Greases, Cup

GEAR HOBBING MACHINES — See Machines, Gear Hobbing

GEAR PULLERS—See Pullers, Gear and Wheel

GEAR SHIFT EXTENSIONS—See Extensions, Gear Shift Lever

GEAR SHIFT LEVER BALLS—See Balls, Composition Control Lever

GEAR SHIFT LEVERS—See Levers, Brake

GEAR SHIFT LEVERS, TRACTOR—See Levers, Tractor Brake and Control

GEAR SHIFTERS—See Shifters, Automatic Gear

GEAR TESTING INSTRUMENTS—See Instruments, Gear Testing

GEAR TOOTH CHAMFERING MACHINES —See Machines, Gear Tooth Chamfering

GEARS, Aeroplane Landing

(See also Parts, Aeroplane Wood)

Ackerman Wheel Co., Rockefeller Bldg., Cleveland, O.

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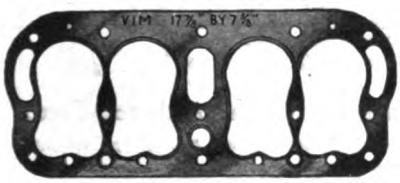

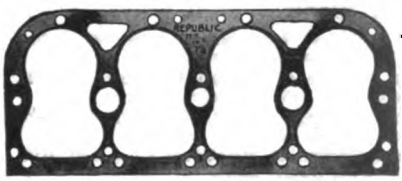

87 Car Models

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Briscoe 1916 Model—No. 84
Buick 4-35-1917—No. 51
Buick 1914 Model—No. 49
Bell Motor—No. 110
Cadillac Eight—No. 15
Chalmers—No. 22
Chevrolet—No. 19
Columbia Six—No. 111
Cole Eight—No. 112
Crow-Elkhart—No. 28
Crawford Six—No. 114
Commonwealth Four—No. 144
Day-Elder—No. 91
Davis Six Model 14—No. 115
Dixie Flyer—No. 116
Denby Truck—No. 117
Dodge—No. 7
Dort—No. 62
Elgin Six—No. 118
Elcar Four—No. 119
Elcar Six—No. 120
Enger—No. 5
Empire Six—No. 121
Federal—No. 94
Fulton Motor Truck—No. 146
Glide 6-40—No. 122
Grant 1916 Model—No. 55
H A L 12—No. 124
Hudson Super-Six—No. 44
Hupmobile 1918 Model—No. 95
Hupmobile 1914 Model—No. 71
Interstate—No. 34
Jackson Four—No. 147
Jackson Eight—No. 145
Kissel Six—No. 6
Kissel Twin-Six—No. 54
Kline 6-38—No. 125
Le Roi—No. 96
Lexington Six—No. 126
Liberty Six—No. 127
Lycoming—No. 101
Madison—No. 128
Marmon—No. 129
Marion-Handley—No. 130
Martin Truck—No. 131
Maxwell—No. 14
Metz—No. 45
Mitchell-Lewis—No. 70
Monroe—No. 16
Moon 6-48—No. 132
Nash Light 6—No. 133
National—No. 42
New Era—No. 98
Oakland Six—No. 57
Oakland Four—No. 90
Oakland 8-50—No. 175
Oakland 8-60—No. 134
Oldsmobile 1914 Model—No. 65
Oldsmobile 1917 Model—No. 72
Overland Model 75—No. 58
Overland Model 83—No. 63
Overland Model 90—No. 74
Overland Model 85-6—No. 135
Overland Model 82-6—No. 100
Packard Twin-Six—No. 64
Paige Model 46—No. 56
Paige Model 39—No. 69
Pathfinder Six—No. 136
Pathfinder Twelve—No. 67
Patterson 4-15—No. 149
Patterson 6-45—No. 137
Pullman—No. 82
Republic—No. 47
Rush Motor Truck—No. 138
Sterling Motor Truck—No. 141
Samson—No. 3
Saxon Six—No. 29
Saxon Four—No. 17
Scripps-Booth 1915 Model—No. 11
Scripps-Booth 1917 Model—No. 33
Stewart Motor Truck—No. 139
Velie—No. 12
Vim—No. 32
Westcott 4 Model 1914-'15—No. 143
Westcott 1916 Model 41—No. 140
Ford

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GEARS, Auxiliary Transmission, for Fords

Crump's—See L. & B. Truck Mfg. Co.

Hess-Scott—See Western Truck Attachment Co.

L. & B. Truck Mfg. Co., 1416 S. Los Angeles St., Los Angeles, Cal. "Crump's."

Moore—See Tractor-Train Co.

Tractor-Train Co., 1346 Wall St., Los Angeles, Cal. "Moore."

Truck Attachment Co., Seattle, Wash. "Wright."

Western Truck Attachment Co., 1510 11th Ave., Seattle, Wash. "Hess-Scott."

Woodward & Rowe, 2125 Michigan Ave., Chicago, Ill.

Wright—See Truck Attachment Co.

GEARS, Blank

(See also Forgings; also Castings; for Fibre Gear Blanks—See Fibre, Hard)

Albaugh Dover Co., 2100 Marshall Blvd., Chicago, Ill. (See page 327.)

American Welding & Mfg. Co., Griswold St., Warren, O.

Anderson Forge & Machine Co., Detroit, Mich. (See page 291.)

Ashley Machine Works, 724 University Ave., Rochester, N. Y.

Billings & Spencer Co., Laurel & Park Sts., Hartford, Conn.

Columbus Forge & Iron Co., Columbus, O. (See page 293.)

Detroit Screw Works, 368 Franklin St., Detroit, Mich.

Ganschow Co., Wm., 1001-05 Washington Blvd., Chicago, Ill. (See page 449.)

General Drop Forge Co., Buffalo, N. Y. (See page 349.)

Gill & Sons Forge & Machine Works, P. H., Lorraine & Otsego Sts., Brooklyn, N. Y. (See page 239.)

Hartford Machine Screw Co., Hartford, Conn. (See page 513.)

Ladish Drop Forge Co., Cudahy, Wis. (See page 333.)

Link-Belt Co., 732 Dime Bank Bldg., Detroit, Mich. (See page 171.)

McInnes Steel Co., Corry, Pa.

Michigan Screw Co., Lansing, Mich.

New England Forge Co., 9 Plymouth St., Worcester, Mass.

Pan Motor Co., St. Cloud, Minn.

Reese Machine & Tool Works, S., 224-30 W. Main St., Plymouth, Pa.

Savage Arms Corp., Sharon, Pa. (See page 213.)

U. S. Automatic Co., Amherst, O.

Western Automatic Machine Screw Co., 750 Lake Ave., Elyria, O. (See page 475.)

Wyman-Gordon Co., Worcester, Mass. (See Back Bone.)

GEARS, Differential

(Complete Differential Units)

Adco—See American Die & Tool Co.

American Die & Tool Co., Reading, Pa. "Adco." (See page 317.)

Badger—See Lewis Differential Co.

Bailey Non-Stall Differential Corp., 1124 Michigan Ave., Chicago, Ill. (See page 335.)

Brown-Lipe-Chapin Co., Syracuse, N. Y. (See page 317.)

Cross Gear & Engine Co., 820 Bellevue Ave., Detroit, Mich. (See page 437.)

Cullman Wheel Co., 1356 Altgeld St., Chicago, Ill. (See page 687.)

Dorr Miller Differential Co., 90 West St., New York, N. Y. (See page 435.)

Elbertz—See Everett Co.

Everitt Co., B. F., Detroit, Mich. "Elbertz." (See page opp. Title page.)

Frost Gear & Forge Co., Jackson, Mich. (See page 485.)

Lewis Differential Co., 121 Huron St., Milwaukee, Wis. "Badger."

Luxmore Differential Co., 122 S. Michigan Ave., Chicago, Ill.

M. & S. Corp., 166 Lycaste Ave., Detroit, Mich.

New Process Gear Corp., Syracuse, N. Y. (See page 315.)

Ross Gear & Tool Co., 800 Heath St., La Fayette, Ind. (See page 311.)

Russel Motor Axle Co., North Detroit, Mich.

Van Dorn & Dutton Co., Dept. A. T. D., Cleveland, O. (See page 357.)

Warner Gear Co., Muncie, Ind. (See page 414.)

Warner Mfg. Co., Toledo, O.

GEARS, Differential, for Fords

(Including both standard and special differentials)

Badger—See Lewis Differential Co.

Bailey Non-Stall Differential Corp., 1124 Michigan Ave., Chicago, Ill. (See page 335.)

Dorr Miller Differential Co., 90 West St., New York, N. Y. (See page 435.)

Lewis Differential Co., 121 Huron St., Milwaukee, Wis. "Badger."

M. & S. Corp., 166 Lycaste Ave., Detroit, Mich.

Simmons Mfg. Co., 2327-43 E. Fourth St., Cleveland, O.

GEARS, FIBRE—See Gears and Pinions, Rawhide

GEARS, METAL—See Gears and Pinions, Metal

GEARS, Motor Boat Reverse

(See also Clutches, Motor Boat Friction)

Atlas Machine Works, 797 St. Aubin Ave., Detroit, Mich. "Bull Dog."

Baldridge Gear Co., Boston, Mass.

Brennan Motor Mfg. Co., 103 Grape St., Syracuse, N. Y.

Bull Dog—See Atlas Machine Works.

Gies Gear Co., 47 Fort St., E., Detroit, Mich.

Joe's—See Snow & Petrelli Mfg. Co.

Johnson Machine Co., Carlyle, 52 Main St., Manchester, Conn.

Langtry Machine & Tool Co., 700 Commonwealth Ave., Detroit, Mich.

Navy Gear Mfg. Co., 61 Court St., New Haven, Conn.

Paragon Gear Works, Taunton, Mass.

Snow & Petrelli Mfg. Co., 152 Brewery St., New Haven, Conn. "Joe's."

W. & M.—See Wilmarth & Morman Co.

Wilmarth & Morman Co., 1179 Monroe Ave., Grand Rapids, Mich. "W. & M."

GEARS, Motor Boat Steering

Carpenter & Co., Geo. B., 440 Wells St., Chicago, Ill.

Edson Mfg. Co., 257 Atlantic Ave., Boston, Mass.

Hall Co., W. S., 17 Elm St., Rochester, N. Y. "Reliance-Rochester."

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PRODUCTS COMPANY
Columbus, Ohio

STEERING GEARS
for all classes of
MOTOR VEHICLES

ALL steering gears are of the worm and gear type, with controls mounted either above or under the steering wheel.

Steering connections are designed with a large factor of safety, and parts subject to excessive strain are made of special Alloy Steel, properly heat-treated.

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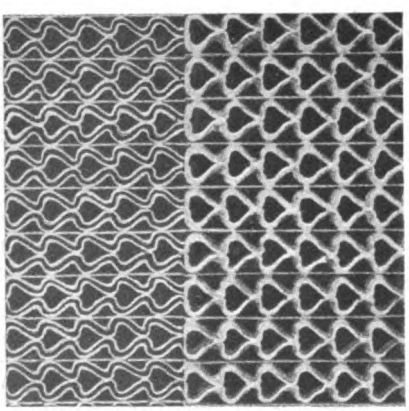

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The Greatest Cooling Device ever invented since radiation was used for cooling of gas engines. The Heart-Shape Core is economical in price, as the waste in construction is practically nil. It is possible to freeze this Heart-Shape Core perfectly solid and then thaw the same without in any way injuring or causing a leak in the core. Note the large water space and air space in cut-out section. The strongest radiator core made. Will stand the greatest vibration. The lightest in weight. A core that can be repaired promptly, efficiently and economically.

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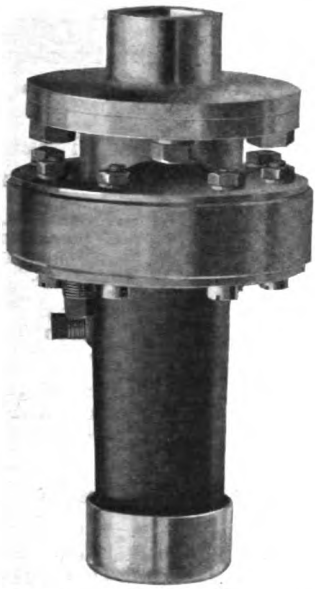

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790 Woodward Ave., Detroit, Mich.

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GEARS, Motor Boat Steering (Continued)

Reliance-Rochester—See Hall Co.

Sea Bright Dory Works, 491 Atlantic Ave., Long Branch, N. J.

Wilcox-Crittenden & Co., 83 Main St., Middletown, Conn.

GEARS, RAWHIDE — See Gears and Pinions, Rawhide

GEARS, SPEEDOMETER—See Gears and Pinions, Rawhide

GEARS, Special Ratio Rear Bevel, for Fords

(Rear bevels and pinions of higher ratio than standard for increasing speed of car for racing purposes)

Cross Gear & Engine Co., 820 Bellevue Ave., Detroit, Mich. (See page 437.)

Detroit Radiator & Specialty Co., 965 Woodward Ave., Detroit, Mich.

Noonan, D. R., 220 W. Washington St., Paris, Ill.

Puritan Machine Co., 422 Lafayette Blvd., Detroit, Mich.

GEARS, Starter Transmission

(For automatically meshing pinion on starter motor with fly wheel gear)

Bendix—See Eclipse Machine Co.

Eclipse Machine Co., Elmira, N. Y. "Bendix." (See page 345.)

GEARS, Steering

(Complete Steering Gear Units)

Boston Gear Works (Norfolk Downs), Quincy, Mass. (See page 319.)

C. A. S. Products Co.—See C. A. S. Engineering Co.

C. A. S. Engineering Co., 790 Woodward Ave., Detroit, Mich. (Sole Distributors for C. A. S. Products Co., Columbus, O.) (See page 312.)

Cross Gear & Engine Co., 820 Bellevue Ave., Detroit, Mich. (See page 437.)

Ditweiler Mfg. Co., Primrose St., Galion, O.

Eclipse Machine Co., Elmira, N. Y. (See page 345.)

Gemmer Mfg. Co., Detroit, Mich.

Goodspeed-Detroit Mfg. Co., 272-80 Harper Ave., Detroit, Mich.

Jackson-Church-Wilcox Co., Hamilton & Moore Sts., Saginaw, W. S., Mich. "Jacox."

Jacox—See Jackson-Church-Wilcox Co.

Keystone-Hindley Gear Co., 20th St. & Indiana Ave., Philadelphia, Pa.

Lavine Gear Co., Racine, Wis. (See page 321.)

Ross Gear & Tool Co., 800 Heath St., La Fayette, Ind. (See page 311.)

S & W—See Schweppe & Wilt Mfg. Co.

Schweppe & Wilt Mfg. Co., Detroit, Mich. "S. & W." (See page 211.)

Superior Machine & Engineering Co., 51-53 Fort St., E., Detroit, Mich.

Warner Co., T. W., Kilgore & Perkins Aves., Muncie, Ind.

Warner Gear Co., Muncie, Ind. (See page 414.)

Wohlrab Gear Co., Fourth St. & Lake Ave., Racine, Wis.

GEARS, Steering, for Fords

Michigan Auto Products Co., Detroit, Mich. "Ospeco." (See page 605.)

Ospeco—See Michigan Auto Products Co.

Sprague Mfg. Co., E. H., 18th & Izard Sts., Omaha, Neb.

GEARS, Tractor Differential

M. & S. Corp., 166 Lycaste Ave., Detroit, Mich.

GEARS, Tractor Steering

Nuttall Co., R. D., McCandless St. & Harrison Ave., Pittsburgh, Pa.

GEARS, Tractor Transmission

Brennan Motor Mfg. Co., 103 Grape St., Syracuse, N. Y.

Dorr Miller Differential Co., 90 West St., New York, N. Y. (See page 435.)

Foote Bros. Gear & Machine Co., 213 Curtiss St., Chicago, Ill. "I. X. L."

Fuller & Sons Mfg. Co., Kalamazoo, Mich. (See page 621.)

Ganschow Co., Wm., 1001-05 Washington Blvd., Chicago, Ill. (See page 449.)

I. X. L.—See Foote Bros. Gear & Machine Co.

Nuttall Co., R. D., McCandless St. & Harrison Ave., Pittsburgh, Pa.

GEARS, Transmission

(Complete Transmission Units)

Adco—See American Die & Tool Co.

American Die & Tool Co., Reading, Pa. "Adco." (See page 317.)

Ball—See New York Gear Works.

Brennan Motor Mfg. Co., 105 Grape St., Syracuse, N. Y.

Brown-Lipe Gear Co., Syracuse, N. Y. (See page 317.)

C. A. S. Engineering Co., 790 Woodward Ave., Detroit, Mich. (Sole Distributors for Mechanics Machine Co., Rockford, Ill.) "Rockford." (See page 313.)

Campbell Transmission Co., Buchanan, Mich.

Cotta Gear Co., 117-29 Morgan St., Rockford, Ill.

Cotta Transmission Co., Rockford, Ill. (See page 321.)

Covert Gear Co., 967 Woodward Ave., Detroit, Mich. (See page 412.)

Cross Gear & Engine Co., 820 Bellevue Ave., Detroit, Mich. (See page 437.)

Detroit Gear & Machine Co., Detroit, Mich. (See page 317.)

Dundore Mfg. Co., 244 Orange St., Reading, Pa.

Durston Gear Co., 21 Maltby St., Syracuse, N. Y.

Entz Motor Patents Corp., 1765 Broadway, New York.

Frost Gear & Forge Co., Jackson, Mich. (See page 485.)

Fuller & Sons Mfg. Co., Kalamazoo, Mich. (See page 621.)

Grant-Lees Gear Co., 2368 69th St., Cleveland, O.

Hoosier Auto Parts Co., 718 S. Elliott St., Muncie, Ind.

Light Mfg. & Foundry Co., Pottstown, Pa.

Mechanics Machine Co.—See C. A. S. Sales Co.

Muncie Gear Works, Muncie, Ind. (See page 727.)

New York Gear Works, 56 Greenpoint Ave., Brooklyn, N. Y. "Ball."

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Our enormous plant concentrates entirely on gear work, and the bulk of our output has gone into the automobile field.

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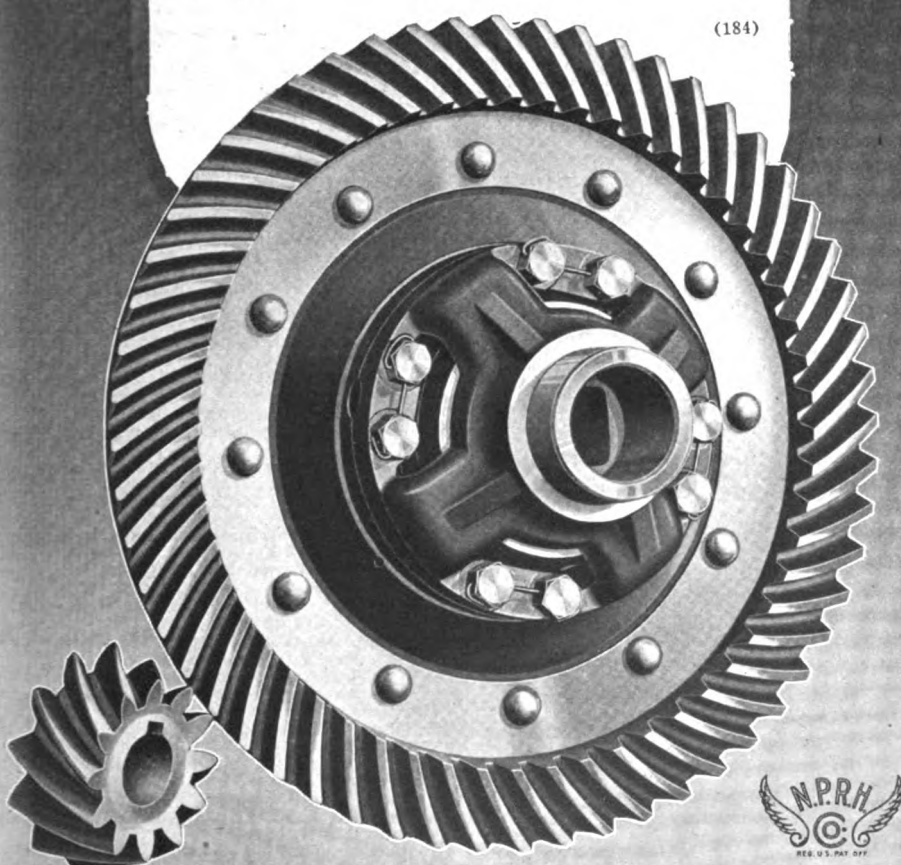

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GEARS, Transmission (Continued)

Parker Transmission & Appliance Co., Fulton, N. Y.
Pittsburgh Model Engine Co., Lexington St. & P. R. R., Pittsburgh, Pa.
Rockford—See C. A. S. Engineering Co.
Savage Arms Corp., Sharon, Pa. (See page 213.)
Superior Machine Tool Co., E. Differbaugh St., Kokomo, Ind.
Superior Machine & Engineering Co., 51-53 Fort St., E., Detroit, Mich.
Syracuse Gear Co., 101 Grape St., Syracuse, N. Y.
Triumph Electric Co., Cincinnati, O. "Vesta."
Turley Gear & Machine Co., 1505-11 N. Tenth St., St. Louis, Mo.
Van Dorn & Dutton Co., Dept. A. T. D., Cleveland, O. (See page 357.)
Vesta—See Triumph Electric Co.
Warner Co., T. W., Kilgore & Perkins Aves., Muncie, Ind.
Warner Gear Co., Muncie, Ind. (See page 414.)
Warner Mfg. Co., Toledo, O.
Yuster Axle & Transmission Co. of America, South Bend, Ind.

GEARS, TRANSMISSION, FOR FORDS—See Gears, Auxiliary Transmission

GEARS and PINIONS, Metal

(Metal Gear cutting on contract to sample or blue print)

Acme Gear Works, 45 Mills St., Astoria, N. Y.
Adams Co., Dubuque, Ia.
Adco—See American Die & Tool Co.
Albaugh Dover Co., 2100 Marshall Blvd., Chicago, Ill. (See page 327.)
Alexander & Cox Co., Ogden & Western Aves., Chicago, Ill.
American Die & Tool Co., Reading, Pa. "Adco." (See page 317.)
Anderson Rolled Gear Co., Berea Rd. & L. S. & M. S. R. R., Cleveland, O.
Arthur Co., 188 Front St., New York, N. Y.
Auto Gear & Parts Co., 291 Marietta St., Atlanta, Ga. (See page 325.)
Baush Machine Tool Co., 156 Wason Ave., Springfield, Mass.
Behrendt, H. F., 22 Green St., Newark, N. J.
Bilgram Machine Works, 1235 Spring Garden St., Philadelphia, Pa.
Boston Gear Works (Norfolk Downs), Quincy, Mass. (See page 319.)
Brown & Sharpe Mfg. Co., Promenade St., Providence, R. I.
Bultman Co., F. H., 2103 Superior Viaduct, Cleveland, O.
Carpenter-Tew Gear Co., 67 35th St., Brooklyn, N. Y.
Chicago Gear Mfg. Co., 1330 W. Jackson Blvd., Chicago, Ill.
Cincinnati Gear Co., 1825-33 Reading Rd., Cincinnati, O.
Cleveland Worm & Gear Co., 1667 E. 40th St., Cleveland, O.
Crofoot Gear Works, 31 Ames St., Cambridge, Mass. (See page 319.)
Cross Gear & Engine Co., 820 Bellevue Ave., Detroit, Mich. (See page 437.)
Currie & Son, J. B., 72 Adams St., Brooklyn, N. Y.
Detroit Gear & Machine Co., Detroit, Mich. (See page 317.)
Dundore Mfg. Co., 244 Orange St., Reading, Pa.
Earle Gear & Machine Co., 4705 Stenton Ave. (Wayne Jct.), Philadelphia, Pa. (See page 339.)
Federal Gear Co., 1754 E. 47th St., Cleveland, O.
Flather Mfg. Co., E. J., Nashua, N. H.
Foote Bros. Gear & Machine Co., 213 Curtiss St., Chicago, Ill.
Frost Gear & Forge Co., Jackson, Mich. (See page 485.)
Ganschow Co., Wm., 1001-05 Washington Blvd., Chicago, Ill. (See page 449.)
Gear Grinding Machine Co., Chene St. & Boulevard, Detroit, Mich.
Gleason Works, 1000 University Ave., Rochester, N. Y.
Gould & Eberhardt, Chancelor & Coit Sts., Irvington, N. J.
Grand Machine Co., 3456 S. Grand Ave., St. Louis, Mo.
Grant Gear Works, 151 Pearl St., Boston, Mass.
Hindley Gear Co., 1105 Frankford Ave., Philadelphia, Pa.
Indianapolis Tool & Mfg. Co., Indianapolis, Ind. (See page 335.)
Keystone-Hindley Gear Co., 20th St. & Indiana Ave., Philadelphia, Pa.
Lauer Machine Co., John, 108-14 St. Antoine St., Detroit, Mich.
Lawrie Co., Fred'k S., Odd Fellows Bldg., Indianapolis, Ind. (Sales Agents.) (See page 867.)
Levene Motor Co., 2200-18 Diamond St., Philadelphia, Pa.
Link-Belt Co., 732 Dime Bank Bldg., Detroit, Mich. (See page 171.)
Meisel Press Mfg. Co., 945 Dorchester, Ave., Boston, Mass. (See page 319.)
Meisselbach-Catucci Mfg. Co., Newark, N. J.
Motors Appliance Co., East Moline, Ill. (See page 781.)
New Process Gear Corp., Syracuse, N. Y. (See page 315.)
New York Gear Works, 56 Greenpoint Ave., Brooklyn, N. Y.
Newark Gear Cutting Machine Co., 67-69 Prospect St., Newark, N. J. (See page 357.)
Nilson-Miller Co., 13th & Hudson Sts., Hoboken, N. J.
Nuttall Co., R. D., McCandless St. & Harrison Ave., Pittsburgh, Pa.
Pennsylvania Gear & Machine Co., 435 N. Broad St., Philadelphia, Pa. (See page 357.)
Philadelphia Gear Works, 1120 Vine St., Philadelphia, Pa.
Premier Mfg. Co., Sandy Hook, Conn.
Pullman-Field Machine Co., Basket St., Sodus, N. Y.
Ross Gear & Tool Co., 800 Heath St., Lafayette, Ind. (See page 311.)
Ross Machine Co., 208 S. Fourth St., La Fayette, Ind.
Savage Arms Corp., Sharon, Pa. (See page 213.)
Sawyer Gear Works, 227 St. Clair St., Cleveland, O.
Service Gear & Machine Co., Second & Buttonwood Sts., Reading, Pa.
Sier-Bath Co., 143 W. 54th St., New York, N. Y. (See page 357.)
South Park Mfg. Co., Port Huron, Mich.
Spacke Machine & Tool Co., Indianapolis, Ind. (See page 427.)
Syracuse Rawhide Mfg. Co., Holland Pl., Syracuse, N. Y.
T. C. M. Mfg. Co., Hunterdon & First Sts., Harrison, N. J.
Timken-Detroit Axle Co., Detroit, Mich.
Turley Gear & Machine Co., 1505-11 N. Tenth St., St. Louis, Mo.
Up-to-Date Machine Works, 2913-15 S. Wabash Ave., Chicago, Ill.
Van Dorn & Dutton Co., Dept. A. T. D., Cleveland, O. (See page 357.)
Warner Gear Co., Muncie, Ind. (See page 414.)

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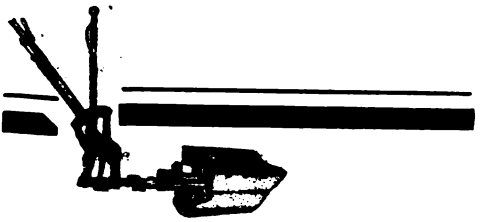

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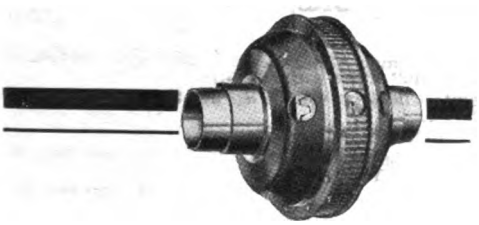

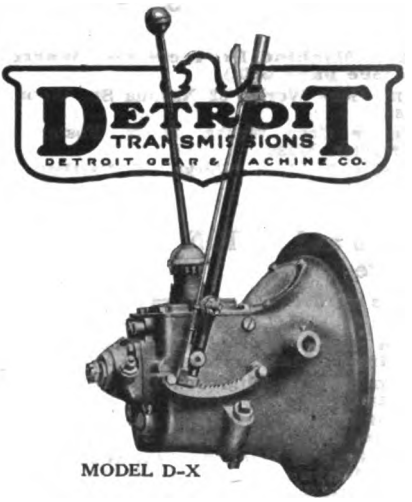

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UNIT POWER PLANT TYPE
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Gear Cutting **Grinding**

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GEARS and PINIONS, Metal (Continued)

Warren Machine Products Co., Warren, Pa. (See page 575.)

Woburn Gear Works, 32 Nashua St., Woburn, Mass.

Worcester Gear Works, 31 N. Foster St., Worcester, Mass.

Worcester Machine Works, 25 Bartlett St., Worcester, Mass.

GEARS and PINIONS, Rawhide and Fibre

(Rawhide or Fibre Gear cutting on contract to sample or blue print)

Boston Gear Works (Norfolk Downs), Quincy, Mass. (See page 319.)

Chicago Rawhide Mfg. Co., 1301 Elston Ave., Chicago, Ill.

Crofoot Gear Works, 31 Ames St., Cambridge, Mass. (See page 319.)

Earle Gear & Machine Co., 4705 Stenton Ave. (Wayne Jct.), Philadelphia, Pa. (See page 339.)

Fabroil—See General Electric Co.

Ganschow Co., Wm., 1001-05 Washington Blvd., Chicago, Ill. (See page 449.)

General Electric Co., Schenectady, N. Y. "Fabroil." (See pages 564 and 565.)

Meisel Press Mfg. Co., 945 Dorchester Ave., Boston, Mass. (See page 319.)

New Process Gear Corp., Syracuse, N. Y. (See page 315.)

Nuttall Co., R. D., McCandless St. & Harrison Ave., Pittsburgh, Pa.

Philadelphia Gear Works, 1120 Vine St., Philadelphia, Pa.

Syracuse Rawhide Mfg. Co., Holland Pl., Syracuse, N. Y.

Van Dorn & Dutton Co., Dept. A. T. D., Cleveland, O. (See page 357.)

Woburn Gear Works, 32 Nashua St., Woburn, Mass.

GEARS and PINIONS, Speedometer

(Metal and Fibre Speedometer Gears and Pinions)

Diamond State Fibre Co., Bridgeport, Pa.

Illinois Brass Mfg. Co., 226-30 W. Ontario St., Chicago, Ill.

Motors Appliance Co., East Moline, Ill. (See page 781.)

GENERATOR BRUSHES — See Brushes, Magneto, Starter and Generator

GENERATOR COILS — See Windings, Starter and Ignition

GENERATOR TUBING—See Tubing, Soft Rubber; also Tubing, Brass and Copper

GENERATOR VALVES, MOTOR BOAT—See Valves, Motor Boat Generator

GENERATOR WINDINGS—See Windings, Starter and Ignition

GENERATORS, Acetylene Gas

(For use on car; for Generators for Welding—See Machines, Autogenous Welding; for Acetylene Tanks —See Tanks, Acetylene)

Columbia—See Hine-Watt Mfg. Co.

Corcoran-Victor Co., 712 Reading Rd., Cincinnati, O. "Victor."

Hall Lamp Co., C. M., Detroit, Mich. "Solar." (See page 385.)

Hawthorne Mfg. Co., 35 Spruce St., Bridgeport, Conn. "Old Sol."

Hine-Watt Mfg. Co., 180 N. Market St., Chicago, Ill. "Columbia."

Neverout—See Rose Mfg. Co.

Old Sol—See Hawthorne Mfg. Co.

Rose Mfg. Co., 910 Arch St., Philadelphia, Pa. "Neverout."

Solar—See Hall Lamp Co.

Victor—See Corcoran-Victor Co.

Warnola Mfg. Co., 73 Wooster St., New York, N. Y.

GENERATORS, ELECTRIC LIGHTING—See Dynamos, Electric Lighting

GENERATORS, ELECTRIC MOTORCYCLE—See Dynamos, Motorcycle Electric Lighting

GENERATORS, ELECTRIC TRACTOR—See Dynamos, Tractor Electric Lighting

GENERATORS, Motorcycle Acetylene

Hall Lamp Co., C. M., Detroit, Mich. "Solar." (See page 385.)

Hawthorne Mfg. Co., 35 Spruce St., Bridgeport, Conn.

Solar—See Hall Lamp Co.

Superior Lamp Mfg. Co., 136 W. 52d St., New York, N. Y.

GENERATORS, Tractor Acetylene

Hall Lamp Co., C. M., Detroit, Mich. "Solar." (See page 385.)

Solar—See Hall Lamp Co.

GERMAN SILVER—See Brass, Sheet

GIMPS, UPHOLSTERY—See Bindings, Upholstery

GLARE DIMMERS—See Dimmers, Glare

GLARE PREVENTERS—See Dimmers or Shades, Headlight

GLARE STOPPERS—See Dimmers, Glare

GLASS, BODY—See Glass, Polished Plate

GLASS CURTAIN WINDOWS—See Windows, Glass Curtain

GLASS CUTTERS—See Cutters, Circular Glass

GLASS FRONTS—See Shields, Wind

GLASS, Polished Plate

(For windshields and closed body work; also for lamp, clock, gage and meter glasses)

American Glass & Beveling Co., Clark & Harriett Sts., Cincinnati, O.

American Window Glass Co., Farmers Bank Bldg., Pittsburgh, Pa. (See page 431.)

Bache & Co., Semon, West & Hubert Sts., New York, N. Y.

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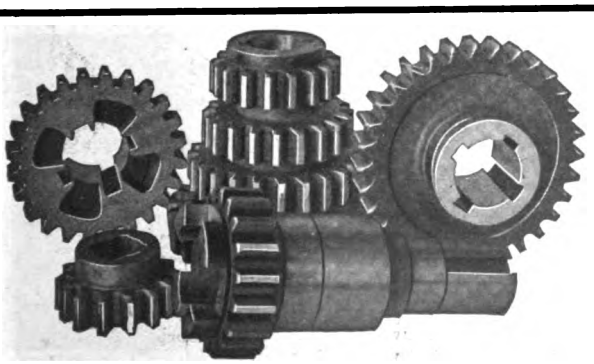

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Automobile Gears of All Kinds Made to Order

Boston Gear Works

Norfolk Downs

Quincy, Mass.

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GLASS, Polished Plate (Continued)

Harris, Chas. H., 142-46 W. 24th St., New York, N. Y.
Hires-Turner Glass Co., 30th & Walnut Sts., Philadelphia, Pa. "Lighthouse."
Lighthouse—See Hires-Turner Glass Co.
Smith, Thos. J. D., 63-71 Chambers St., Newark, N. J.
Super-Glass Co., 3400 Disston St. (Tacony), Philadelphia, Pa.
Tyler & Hippach, 366-400 W. Ohio St., Chicago, Ill.
Waxman & Co., A., 420 N. Third St., Philadelphia, Pa.

GLASS, WINDSHIELD—See Glass, Polished Plate

GLASS WINDSHIELD CLEANERS—See Cleaners, Wind Shield; also Compounds, Glass Wind Shield

GLASS, WINDOW—See Glass, Polished Plate

GLASSES, Lamp

(For Dimming or Deflecting lamp glasses—See Dimmers, Headlight)

Amesbury Bent Glass Co., Carriage Ave., Amesbury, Mass.
Houze Convex Glass Co., L. J., Jane St., Point Marion, Pa.
Jefferson Glass Co., Follansbee, W. Va.
Lancaster Lens Co., 220-26 W. Main St., Lancaster, O.
Standard Glass Specialty Co., Morgantown, W. Va.

GLASSES, Lubricator

(Glass cylinders and tubes for lubricators and sight feeds)

Bache & Co., Semon, West & Hubert Sts., New York, N. Y.
Moncrieff—See Rogers Co.
Perth—See Rogers Co.
Rogers Co., H. A., 87 Walker St., New York, N. Y. (Importers.) "Moncrieff," "Unific," "Perth."
Unific—See Rogers Co.

GLOVES and GAUNTLETS, Motorists

Allen Glove Co., 15 Forrest St., Gloversville, N. Y.
American Glove Co., 2013 Churchill St., Chicago, Ill.
Bi-Plane—See Morrison-Ricker Mfg. Co.
Bishop Co., J. H., Wyandotte, Mich.
Black Ghost—See Heagle, James.
Bradford, R. E., 5 Burr St., Gloversville, N. Y.
Crosby-Frisian Fur Co., 571 Lyell Ave., Rochester, N. Y.
Eisendrath Glove Co., 2001 Elston Ave., Chicago, Ill.
Ellsworth & Thayer Mfg. Co., 336-40 Broadway, Milwaukee, Wis. "Kantryp."
Fried, Ostermann Co., 617-45 Reed St., Milwaukee, Wis. "Price."
Gloversville Auto-Glove Co., 69-73 W. Fulton St., Gloversville, N. Y. "M. W. M."
Grinnell—See Morrison-Ricker Mfg. Co.
Grip-Tite—See Morrison-Ricker Mfg. Co.
Hansen Mfg. Co., O. C., Detroit & Milwaukee Sts., Milwaukee, Wis.
Heagle, James, First Ave. & Market St., Johnstown, N. Y. "Black Ghost."
Kantryp—See Ellsworth & Thayer Mfg. Co.
Limp-Kuff—See Morrison-Ricker Mfg. Co.
Luther Glove Co., J. P., Berlin, Wis. "Red Ball."
M. W. M.—See Gloversville Auto Glove Co.
Morawetz Co., 217-25 E. Water St., Milwaukee, Wis.
Morrison-Ricker Mfg. Co., 72 Broad St., Grinnell, Ia. "Grinnell," "Rist-Fit," "Grip-Tite," "Limp-Kuff," "Bi-Plane."
Pontiac Knitting Co., Pontiac, Mich.
Price—See Fried, Ostermann Co.
Red Ball—See Luther Glove Co.
Ripon Knitting Works, Ripon, Wis.
Rist-Fit—See Morrison-Ricker Mfg. Co.
Stifel & Sons, J. L., Wheeling, W. Va.
Syracuse & Eldridge Glove & Lessing Co., 107 N. Franklin St., Syracuse, N. Y.
Wallace Co., Hugh, 2626 E. Grand Boulevard, Detroit, Mich.
Walrath Glove Co., Gloversville, N. Y.

GLOVES and MITTENS, Aviators

(For Clothing—See Clothing; for Helmets—See Helmets)

Bradford, R. E., 5 Burr St., Gloversville, N. Y. "Escadrille."
Centemeri & Co., P., 400 Fifth Ave., New York, N. Y.
Escadrille—See Bradford, R. E.
Morrison-Ricker Mfg. Co., 72 Broad St., Grinnell, Iowa.
Spalding & Bros., A. G., 126 Nassau St., New York, N. Y.

GLOVES, Rubber

(Acid Proof Gloves for storage battery workers)

Aetna Rubber Co., 815 E. 79th St., Cleveland, O.

GLUE, Aircraft Liquid

(See also Cement, Aeroplane Waterproof)

Certus Cold Glue Co., Detroit, Mich.
Ferdinand & Co., L. W., 152 Kneeland St., Boston, Mass. "Jeffery's." (See page 379.)
Jeffery's—See Ferdinand & Co.

GLUE HEATERS—See Heaters, Glue

GLUE, LINOLEUM—See Cement, Linoleum

GOGGLES, Aviators

Aero Goggle Co., 150 Nassau St., New York, N. Y. "Duplex."
American Optical Co., Southbridge, Mass. "Wellsworth."
Aviglass—See Hardy & Co.
Duplex—See Aero Goggle Co.
Hardy & Co., F. A., 10 S. Wabash Ave., Chicago, Ill. "Aviglass."
Resistol—See Strauss & Buegeleisen.
Strauss & Buegeleisen, 438 Broadway, New York, N. Y. "Resistol."
Triplex Safety Glass Corp., 19 W. 44th St., New York, N. Y.
Wellsworth—See American Optical Co.

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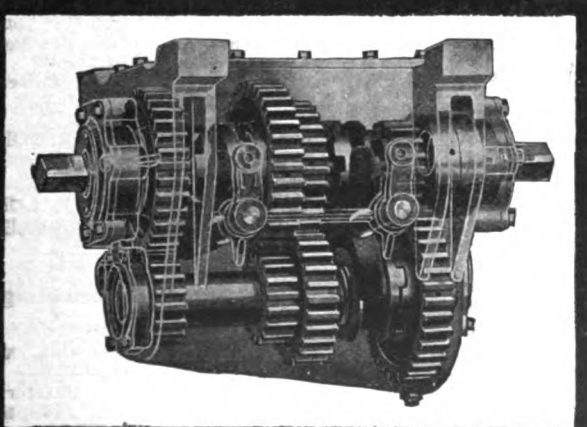

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GOGGLES, Mechanics and Welders

Adams, William C., 332 Boylston St., Boston, Mass.

Chicago Eye Shield Co., Chicago, Ill. "Fyber-Weld." (See page 689.)

Fyber-Weld—See Chicago Eye Shield Co.

Strauss & Buegeleisen, 438 Broadway, New York, N. Y.

GOGGLES and EYE SHIELDS, Motorists

Adams, William C., 332 Boylston St., Boston, Mass.

Albex—See Willson & Co.

Allwon—See Strauss & Buegeleisen.

American Optical Co., Southbridge, Mass. "Sedan," "Biplane."

American Spectacle Co., 47 W. 34th St., New York, N. Y.

Aristocrat—See Cohn & Co.

Autoglass—See Hardy & Co.

Biplane—See American Optical Co.

Boston—See Chicago Eye Shield Co.

Cheyenne—See Chicago Eye Shield Co.

Chicago Eye Shield Co., Chicago, Ill. "Boston," "Rex," "Panama," "Cheyenne." (See page 689.)

Cohn & Co., Max G., 19 Madison Ave., New York, N. Y. "Peerless," "Turtle," "Tourist," "Aristocrat," "Elite."

De Luxe—See Griffin, G. A.

Dimmer Goggle Co., Whiting, Ind.

Eff & See—See Frank & Co.

Elite—See Cohn & Co.

Essex Rubber Co., Trenton, N. J.

Eyetects—See Strauss & Buegeleisen.

Frank & Co., Arthur, 71-73 Nassau St., New York, N. Y. "Eff and See."

George—See Hainert & Son.

Griffin, G. A., 110 E. 23d St., New York, N. Y. "De Luxe."

Haco—See Hudson Products Co.

Hainert & Son, F. H., 3043 Nicollet Ave., Minneapolis, Minn. "George."

Hardy & Co., F. F., 10 S. Wabash Ave., Chicago, Ill. "Autoglass."

Hudson Products Co., 44 E. 23d St., New York, N. Y. "Haco."

Humaco—See Humboldt Mfg. Co.

Humboldt Mfg. Co., 266 Hyde Park Ave. (Forest Hills), Boston, Mass. "Humaco."

Jay & Dee Specialty Co., 41 Park Row, New York, N. Y.

Keystone—See Willson & Co.

King Optical Co., F. W., Euclid Arcade, Cleveland, O.

Kirstein Sons Co., E., 242 Andrews St., Rochester, N. Y. "Shur-On."

New Era Optical Co., 123 W. Madison St., Chicago, Ill. "Toricle."

Mucallte—See Strauss & Buegeleisen.

Nosquint—See Strauss & Buegeleisen.

Overall—See Strauss & Buegeleisen.

Panama—See Chicago Eye Shield Co.

Peerless—See Cohn & Co.

Pennsylvania Optical Co., 125 S. Fifth St., Reading, Pa.

Resistal—See Strauss & Buegeleisen.

Rex—See Chicago Eye Shield Co.

Sedan—See American Optical Co.

Shur On—See Kirstein Sons Co.

Standard Optical Co., Geneva, N. Y. "Stoco."

Stoco—See Standard Optical Co.

Strauss & Buegeleisen, 438 Broadway, New York, N. Y. "Allwon," "Eyetects," "Resistal," "Ventiflex," "Nucalite," "Nosquint," "Overall."

Toricle—See New Era Optical Co.

Tourist—See Cohn & Co.

Triplex Safety Glass Corp., 19 W. 44th St., New York, N. Y.

Turtle—See Cohn & Co.

Ventiflex—See Strauss & Buegeleisen.

Willson & Co., T. A., Second & Washington Sts., Reading, Pa. "Albex," "Zylbex," "Keystone."

Zylbex—See Willson & Co.

GOGGLES, WELDERS—See Goggles, Mechanics

GONGS, MECHANICAL—See Bells, Mechanical

GOVERNORS, Engine

(For keeping the speed of a car below predetermined limits)

D & P Auto Repair Co., 1926 Broadway, New York, N. Y.

Duplex Engine-Governor Co., 36 Flatbush Ave. Extension, Brooklyn, N. Y.

Evans—See Hoffecker Co.

Hoffecker Co., Motor Mart Bldg., Boston, Mass. "Evans."

Kramer—See Monarch Governor Co.

Monarch Governor Co., 508 Bethune Ave., W., Detroit, Mich. "Kramer."

Pharo Mfg. Co., 1336 Woodward Ave., Detroit, Mich. (See page 529.)

Pierce Governor Co., Anderson, Ind. (See page 323.)

Steele, W. M., 98 Beacon St., Worcester, Mass.

Victor Engineering Co., 214 N. Fulton St., Allentown, Pa.

GOVERNORS, Engine, for Fords

(For keeping the speed of the car below predetermined limits)

Detroit Motor Governor Corp., Ford Bldg., Detroit, Mich. (See page 323.)

Kramer—See Monarch Governor Co.

Monarch Governor Co., 508 Bethune Ave., W., Detroit, Mich. "Kramer."

Pierce Governor Co., Anderson, Ind. (See page 323.)

GRAPHITE CYLINDER CUPS—See Lubricators, Cup Cylinder

GRAPHITE CYLINDER LUBRICATORS—See Lubricators, Cup Cylinder

GRAPHITE, Lubricating

(For Graphite Grease—See Lubricants)

Acheson Graphite Co., Niagara Falls, N. Y. (See page 327.)

Chester Graphite Co., Chester Springs, Pa.

Dixon Crucible Co., Joseph, Jersey City, N. J. (See page 439.)

Durkee-Atwood Co., Minneapolis, Minn. "Rie-Nie."

Rie-Nie—See Durkee-Atwood Co.

United States Graphite Co., Saginaw, Mich.

Wisconsin Graphite Co., Stevens Point, Wis.

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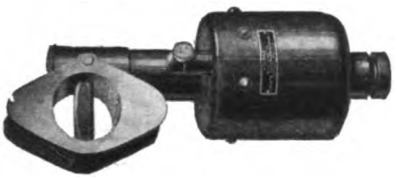
Pierce Governors



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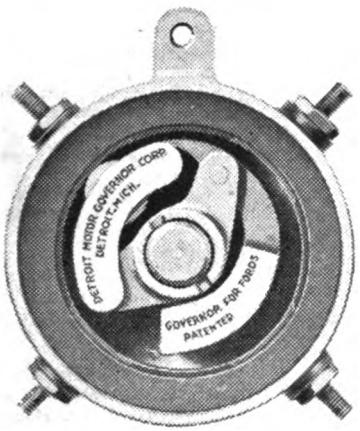

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GRAY IRON CASTINGS—See Castings, Gray Iron

GREASE BAGS — See Boots, Steering Knuckle

GREASE CUP WRENCHES—See Wrenches, Grease Cup

GREASE CUPS—See Cups, Oil and Grease

GREASE GUN LOADERS—See Loaders, Grease Gun

GREASE GUNS—See Guns, Grease

GREASE RETAINERS FOR FORDS—See Retainers, Rear Axle Grease

GREASES, Cup and Gear

Acheson Graphite Co., Niagara Falls, N. Y. "Gredag." (See page 327.)
Admsco—See Millers Sons Co.
Advance Grease Co., Jackson, Mich.
Advance Oil Works, 310-12 Flushing Ave., Brooklyn, N. Y.
Albany Lubricating Co., 708-10 Washington St., New York, N. Y. "Cooks."
Alexander & Co., H. T., 17 Battery Pl., New York, N. Y. "Grand Prix."
Amalie—See Sonneborn Sons.
American—See Miller Co.
American Oil Co., Jackson, Mich. "Amoco," "Gearo."
Amoco—See American Oil Co.
Apex—See Puente Oil Co.
Arco Co., Euclid Ave. & E. 65th St., Cleveland, O.
Atlas—See Swan & Finch Co.
Aurora—See Pigot-Sayre Co.
Autosponge—See Vacuum Oil Co.
Badger—See Wadhams Oil Co.
Balkan—See Jones & Bro., J.
Banner—See Clarkson & Ford Co.
Baum's Castorine Co., 104 N. George St., Rome, N. Y.
Bayerson Oil Works, E. 12th St. & P. R. R., Erie, Pa. "Ebonite," "Kling-Tite."
Besly & Co., Charles H., 118-24 N. Clinton St., Chicago, Ill. "Helmet."
Best—See Van Tilburg Oil Co.
Bison—See Cataract Refining & Mfg. Co.
Black Diamond—See Sweet, Charles F.
Bliven & Carrington, 29 Moore St., New York, N. Y. "E. Z. Way."
Borne, Scrymser Co., 80 South St., New York, N. Y. "Colonial," "Silex."
Buck & Co., E. A., Worcester, Mass. "Powero."
Bull Dog—See Climax Western Oil Co.
C. A. C. Lubricants Co., 31 N. Foster St., Worcester, Mass. "Speedolene." (See page 327.)
Calypsol—See Cataract Refining & Mfg. Co.
Camden Chemical Mfg. Co., 18th & Mickle Sts., Camden, N. J. "Greyhound."
Carolene—See Valley Oil Co.
Cascade—See Cataract Refining & Mfg. Co.
Cassco Bar-Metallic Packing Co., 8 S. Dearborn St., Chicago, Ill.
Cataract Refining & Mfg. Co., Marine National Bank Bldg., Buffalo, N. Y. "Bison," "Calypsol," "Cascade."
Chainolene Mfg. Co., 617-19 Fulton St., Chicago, Ill.
Chester Graphite Co., Chester Springs, Pa. "Hexagon."
Cincinnati Oil Works Co., 525 Eggleston Ave., Cincinnati, O. "Nonfrixo."
Clarkson & Ford Co., 55 Water St., New York, N. Y. "Banner."
Climax—See Sweet, Charles F.
Climax Lubricating Co., 218 N. 13th St., Philadelphia, Pa.
Climax Western Oil Co., 2824 Tenth Ave., S., Minneapolis, Minn. "Bull Dog."
Colonial—See Borne, Scrymser Co.
Columbia Refining Co., 90 West St., New York, N. Y. "K. A. C.," "Royal."
Connecticut Oil Co., 549 S. Leonard St., Waterbury, Conn.
Continental Oil Products Co., 208 S. La Salle St., Chicago, Ill.
Cooks—See Albany Lubricating Co.
Crane & Co., 91 Oliver St., Boston, Mass. "Eureka."
Crawford Co., Wm. J., 14 Wood St., Pittsburgh, Pa.
Crew-Levick Co., 111 N. Broad St., Philadelphia, Pa. "Perfection."
Crown—See Kellogg & Co.
Cupese—See Swan & Finch Co.
Currola—See Curry Bros. Oil Co.
Curry Bros. Oil Co., 253-55 Franklin St., Boston, Mass. "Currola," "Superba."
Detroit—See Zurn Co.
Dixon Crucible Co., Joseph, Jersey City, N. J. (See page 439.)
Drake Oil Co., 99 E. Spring St., Titusville, Pa.
Duffy Oil & Grease Co., 505 W. 45th St., New York, N. Y.
Duplex—See Enterprise Oil Co.
Durkee-Atwood Co., Minneapolis, Minn. "Rie-Nie."
E. Z. Way—See Bliven & Carrington.
Eagle Oil & Supply Co., 45 India St., Boston, Mass. "Eagleine."
Eagleine—See Eagle Oil & Supply Co.
Ebonite—See Bayerson Oil Works.
Economy—See Pennsylvania Lubricating Co.
Emco—See Emery Mfg. Co.
Emery Mfg. Co., Bradford, Pa. "Emco."
Empire—See Richardson Lubricating Co.
Energine Refining & Mfg. Co., The Arcade, Cleveland, O.
Ensign Refining Co., 10605 Quebec Ave., Cleveland, O.
Enterprise Oil Co., 164 Chandler St., Buffalo, N. Y. "Duplex."
Eureka—See Crane & Co.
Evr-Lastin—See Imperial Oil Co.
Excelsior—See Kellogg & Co.
Excelsior—See Miller's Sons.
Excelsior—See Mills Oil Co.
Faultless—See Hawkeye Oil Co.
Fibroviscos—See Sheppard, W. S.
Fiske Bros. Refining Co., 24 State St., New York, N. Y. "Lubroleine."
Frank Oil Co., 23 W. Spring St., Titusville, Pa.
Frazer Lubricator Co., 3921 Normal Ave., Chicago, Ill.
Fulcrum Oil Co., Franklin, Pa.
Gearease—See Swan & Finch Co.
Gearo—See American Oil Co.
Germanic—See Wood Co.
Gold Medal—See Monarch Mfg. Co.
Grand Prix—See Alexander & Co.
Greasol—See Hobson Oil Co.
Great Western Oil Co., 2855 E. 37th St., Cleveland, O.
Gredag—See Acheson Graphite Co.

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GREASES, Cup and Gear (Cont'd)

Gree-No-Co—See Greenslade Oil Co.

Green Seal—See Monarch Mfg. Co.

Green Seal—See Phoenix Oil Co.

Greenslade Oil Co., 40 Jefferson Ave., Detroit, Mich. "Gree-no-co."

Greoil—See Robinson & Son Co.

Greyhound—See Camden Chemical Mfg. Co.

Haggerty Refining Co., 50 South St., New York, N. Y. "Thermo."

Hall-Thompson Co., Hartford, Conn. "Wonder Worker." (See page 739.)

Harris Oil Co., A. W., 326 S. Water St., Providence, R. I.

Havoline—See Indian Refining Co.

Hawkeye Oil Co., Miles & Roosevelt Sts., Waterloo, Ia. "Faultless."

Haws, Geo. A., 135 Front St., New York, N. Y. "Panhard."

Helmet—See Besly & Co.

Hercules—See Media Grease Co.

Hexagon—See Chester Graphite Co.

Hobson Oil Co., 1974 Broadway, New York, N. Y. "Greasol," "Knight."

Hollingshead Co., R. M., 112 N. Ninth St., Camden, N. J. "Whiz."

Houghton & Co., E. F., 240 W. Somerset St., Philadelphia, Pa.

I. X. L.—See Kramer Oil Co.

Ideal—See Sheppard, W. S.

Imperial Oil Co., 1915 Locust St., St. Louis, Mo. "Evr-Lastin." (See page 197.)

Indian Refining Co., 244 Madison Ave., New York, N. Y. "Havoline."

Ironsides Co., Hartman Bldg., Columbus, O. "Shield." (See page 527.)

Jones & Bro., J., 429 Locust St., Philadelphia, Pa. "Balkan."

K. A. C.—See Columbia Refining Co.

Kellogg & Co., E. H., 243-44 South St., New York, N. Y. "Crown," "Excelsior."

Kelly Graphite Mills, 351 W. 26th St., New York, N. Y.

Kenco—See Kendall Refining Co.

Kendall Refining Co., Bradford, Pa. "Royal," "Kenco."

Keystone Oil & Mfg. Co., 111 N. Market St., Chicago, Ill.

Kilnoys—See Miller Co.

Kling-Tite—See Bayerson Oil Works.

Knight—See Hobson Oil Co.

Kramer Oil Co., W. J., 214-16 Read St., Milwaukee, Wis. "I. X. L."

La-Lo Chemical Co., Providence, R. I.

Layton Park Oil & Soap Co., M. & M. Bank Bldg., Milwaukee, Wis.

Lion—See Moore Oil Co.

Loos & Dilworth, 134 S. Front St., Philadelphia, Pa. "Pioneer."

Lubrex Mfg. Co., Pittsburgh, Pa.

Lubriko Co., Meadow & Jackson Sts., Philadelphia, Pa.

Lubroleine—See Fiske Bros. Refining Co.

McLean-Jones Oil & Supply Co., 40 India Wharf, Boston, Mass. "Swastika."

Marathon—See Weinberg & Co.

Marshall Oil Co., Marshalltown, Ia. "Moco," "Rex."

Master—See Pure Oil Co.

Media Grease Co., Media, Pa. "Hercules."

Micaflake—See U. S. Mica Mfg. Co.

Miller Co., Wm. P., 244-50 Green St., Brooklyn, N. Y. "American," "Kilnoys."

Miller's Sons, Wm. P., Brooklyn, N. Y. "Excelsior."

Millers Sons Co., A. D., Columbus & Preble Aves., Pittsburgh, Pa. "Perfection," "Admsco."

Mills Oil Co., C. E., 263 Walton St., Syracuse, N. Y. "Excelsior."

Milwaukee Lubricants Co., 224 Broadway, Milwaukee, Wis.

Mobilubricant—See Vacuum Oil Co.

Moco—See Marshall Oil Co.

Monamobile—See Monarch Mfg. Co.

Monarch Mfg. Co., Council Bluffs, Ia. "Gold Medal," "Green Seal," "Monamobile."

Monogram—See New York Lubricating Oil Co.

Moore Oil Co., York St. & McLean Ave., Cincinnati, O. "Lion."

Motogrease—See Vacuum Oil Co.

Motor Mica Mfg. Co.—See Zinke Co.

Motorlight—See Petroleum Coke Co.

Motorlube—See Tygert Co.

Napoleon—See Van Tilburg Oil Co.

National Oil & Supply Co., 180 Freylinghuysen Ave., Newark, N. J. "Viscos."

National Refining Co., Rose Building, Cleveland, O.

New York Lubricating Oil Co., 116 Broad St., New York, N. Y. "Monogram."

New York & New Jersey Lubricant Co., 165 Broadway, New York, N. Y. "Non-Fluid."

Nobetr—See Sawyer Oil Co.

Noble Refining Co., 706 Canal Rd., Cleveland, O.

Non-Fluid—See New York & New Jersey Lubricant Co.

Nonfrixo—See Cincinnati Oil Works Co.

O'Neil Oil & Paint Co., 297-303 E. Water St., Milwaukee, Wis. "Velvet."

Ohio Grease Co., Box 21, Loudonville, O. (See page 199.)

Olzum—See White & Bagley Co.

Ottomo—See Pioneer Mfg. Co.

Owl—See Western Chemical Mfg. Co.

Palmetto—See Tropical Paint & Oil Co.

Palubco—See Pennsylvania Lubricating Co.

Panhard—See Haws, Geo. A.

Paragon Refining Co., 2935 Front St., Toledo, O. "Polar."

Parker Refining Co., 1307 W. 11th St., Cleveland, O.

Patterson Lubricating Co., 114 Broad St., Boston, Mass.

Penn—See Pennsylvania Lubricating Co.

Penn Petroleum & Supply Co., 115-17 N. Second St., Philadelphia, Pa. "Primus."

Pennsylvania Lubricating Co., 34th St. & A. V. Ry., Pittsburgh, Pa. "Penn," "Sylvan," "Economy," "Palubco."

Perfection—See Crew-Levick Co.

Perfection—See Millers Sons Co.

Perfection—See Sawyer Oil Co.

Perfection—See Wood Co.

Perfecto—See Young & Kimball.

Perry Oil Co., 372 Central Ave., Pawtucket, R. I.

Petroleum Coke Co., Edgemont & Venango Sts., Philadelphia, Pa. "Motorlight."

Petroleum Products Co., 39th St. & B. & O. R. R., Pittsburgh, Pa. "Sound-Proof."

Philadelphia Grease Mfg. Co., 348-50 S. Swanson St., Philadelphia, Pa.

Phoenix Oil Co., 2554 W. Fifth St., Cleveland, O. "Green Seal."

Pigot-Sayre Co., 71-72 Front St., New York, N. Y. "Aurora."

Pioneer—See Loos & Dilworth.

Pioneer Mfg. Co., Harvard Ave. & E. 103d St., Cleveland, O. "Ottomo."

Polar—See Paragon Refining Co.

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The fault of most lubricants is that they run out or get gummy.

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Spedolene acts like a charm on all gears, new or worn.

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Try this experiment.

Take a pinch of Gredag and rub it between your fingers. Note there is not a particle of grit.

Now try the same test with any other graphite grease. Note how gritty it feels.

That is because Gredag is made with Acheson Graphite, 99.9 percent pure. All other graphite greases are made from mined graphite. (All mined graphite contains 3½ to 18 percent ground rock or other gritty impurities.)

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Fig. 6—Wedges Pounded into Scrolls by Blows of 70 Foot-Pounds.

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GREASES, Cup and Gear (Cont'd)

Polarine—See Standard Oil Co. of N. Y.
Powero—See Buck & Co.
Primus—See Penn Petroleum & Supply Co.
Puente Oil Co., Central Bldg., Los Angeles, Cal. "Apex."
Pure Oil Co., First St. & 13th Ave., S., Minneapolis, Minn. "Puritan," "Master."
Puritan—See Pure Oil Co.
Puritan Oil & Paint Co., 1218 W. 70th St., Cleveland, O.
Rex—See Marshall Oil Co.
Richardson Lubricating Co., Quincy, Ill. "Empire."
Rie-Nie—See Durkee-Atwood Co.
Riverside Oil Co., Benedum Trees Bldg., Pittsburgh, Pa.
Robinson & Son Co., Wm. C., 32 South St., Baltimore, Md. "Greoil."
Royal—See Columbia Refining Co.
Royal—See Kendall Refining Co.
Sawyer Oil Co., Howard B., 62 Long Wharf, Boston, Mass. "Nobetr," "Perfection."
Shamrock—See Sinclair Refining Co.
Sheppard, W. S., 21 Lawrence St., Newark, N. J. "Fibroviscos," "Ideal."
Shield—See Ironsides Co.
Silex—See Borne, Scrymser Co.
Sinclair Refining Co., 111 W. Washington St., Chicago, Ill. "Shamrock."
Sonneborn Sons, L., 262 Pearl St., New York, N. Y. "Amalie." (See page 277.)
Sound-Proof—See Petroleum Products Co.
Speare's Sons Co., Alden, 140 Sixth St., Boston, Mass.
Speedolene—See C. A. C. Lubricants Co.
Standard Oil Co. of N. Y., 26 Broadway, New York, N. Y. "Polarine."
Sullivan Oil Co., 413 Wells St., Chicago, Ill.
Superba—See Curry Bros. Oil Co.
Superior Oil Co., Century Bldg., Cleveland, O.
Sutherland & Co., P. 232 Milk St., Boston, Mass. "Velvet."
Swan & Co., Alden S., 135 Front St., New York, N. Y. "Swanovia."
Swan & Finch Co., 165 Broadway, New York, N. Y. "Atlas," "Gearease," "Cupese."
Swanovia—See Swan & Co.
Swastika—See McLean-Jones Oil & Supply Co.
Sweet, Charles F., 247 State St., Hartford, Conn. "Climax," "Black Diamond."
Sylvan—See Pennsylvania Lubricating Co.
Texaco—See Texas Co.
Texas Co., 17 Battery Pl., New York, N. Y. "Texaco."
Thermo—See Haggerty Refining Co.
Tide Water Oil Co., Bowling Green Bldg., New York, N. Y. "Veedol." (See page 487.)
Toco—See Tropical Paint & Oil Co.
Trojan—See Van Tilburg Oil Co.
Tropical Paint & Oil Co., W. 70th St. & L. S. & M. S. Ry., Cleveland, O. "Toco," "Palmetto."
Tulc—See Universal Lubricating Co.
Twentieth Century—See Zinke Co.
Tygert Co., E. A., 126 N. Front St., Philadelphia, Pa. "Motorlube."
Union Petroleum Co., Widener Bldg., Philadelphia, Pa.
U. S. Mica Mfg. Co., Chicago, Ill. "Micaflake. (See page 743.)
United States Graphite Co., Saginaw, Mich.
Universal—See Young & Kimball.
Universal Lubricating Co., Schofield Bldg., Cleveland, O. "Tulc."
Vacuum Oil Co., 61 Broadway, New York, N. Y. "Mobilubricant," "Motogrease," "Autosponge."
Valley Oil Co., Century Bldg., Cleveland, O. "Carolene."
Valvoline Oil Co., 11 Broadway, New York, N. Y.
Van Tilburg Oil Co., 2424-28 University Ave., S. E., Minneapolis, Minn. "Napoleon," "Trojan," "Best."
Veedol—See Tide Water Oil Co.
Velvet—See O'Neil Oil & Paint Co.
Velvet—See Sutherland & Co.
Velvet—See Winne, Howard B.
Veracity—See Warren Refining & Chemical Co.
Visco Motor Oil Co., 2104 Superior Viaduct, Cleveland, O.
Viscos—See National Oil & Supply Co.
Viscosity Oil Co., 1101-03 W. 37th St., Chicago, Ill.
Wadhams Oil Co., 357 Clinton St., Milwaukee, Wis. "Badger."
Warren Refining & Chemical Co., Cleveland, O. "Veracity."
Waverly Oil Works Co., Pittsburgh, Pa. (See page 479.)
Weinberg & Co., J. H., 128 Maiden Lane, New York, N. Y. "Marathon."
Western Chemical Mfg. Co., 151 Sixth St., Milwaukee, Wis. "Owl."
White Star Refining Co., 615 Avery Ave., Detroit, Mich.
White & Bagley Co., Worcester, Mass. "Oilsum." (See page 479.)
Whitmore Mfg. Co., 33 Iron Ct., Cleveland, O.
Whiz—See Hollingshead Co.
Winn, Wm. R., 143 Maiden Lane, New York, N. Y.
Winne, Howard B., 714 W. Jackson Blvd., Chicago, Ill. "Velvet."
Wolverine Lubricants Co., 80 Broad St., New York, N. Y. (See page 479.)
Wonder Worker—See Hall-Thompson Co.
Wood Co., W. A., 373 Atlantic Ave., Boston, Mass. "Perfection," "Germanic."
Young & Kimball, Frank L., 111 Purchase St., Boston, Mass. "Universal," "Perfecto."
Zinke Co., 1323-25 Michigan Ave., Chicago, Ill. (Sole Distributors for Motor Mica Products Co., Chicago, Ill. "Twentieth Century.") (See page 550.)
Zurn Co., O. F., 2736-38 N. Broad St., Philadelphia, Pa. "Detroit."

GRINDERS, Chucking

Bryant Chucking Grinder Co., 357 Clinton St., Springfield, Vt.

GRINDERS, Crank Pin

Landis Tool Co., Waynesboro, Pa. (See page 331.)
Norton Grinding Co., New Bond St., Worcester, Mass.
Pratt & Whitney Co., 111 Broadway, New York, N. Y. (See page 73.)
Tindel-Albrecht—See Tindel-Morris Co.
Tindel-Morris Co., Eddystone, Pa. "Tindel-Albrecht."

GRINDERS, CUTTER — See Grinders, Reamer and Cutter

GRINDERS, Cylinder

Brown & Sharpe Mfg. Co., Promenade St., Providence, R. I.
Clark—See Pennypacker Mfg. Co.
Heald Machine Co., 22 New Bond St., Worcester, Mass.
Hy-Grade Machine Co., 5606 Curtis Ave., Cleveland, O.

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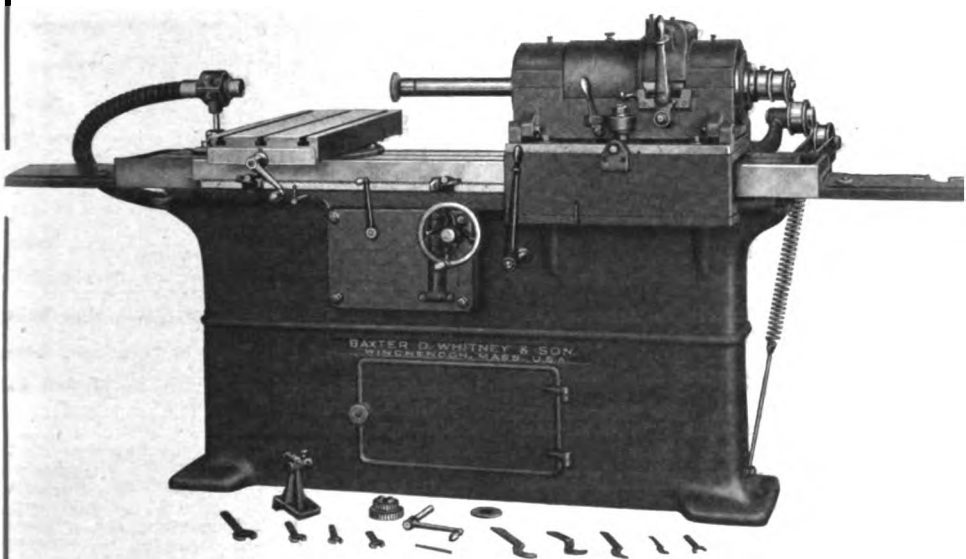

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GRINDERS, Cylinder (Continued)

Madison Machine Tool Co., 323 W. Johnson St., Madison, Wis.

Pennypacker Mfg. Co., 1530 W. Pico St., Los Angeles Cal. "Clark."

Schmidt Co., B. L., Davenport, Ia. (See page 243.)

Whitney & Son, Baxter D., Winchendon, Mass. (See pages 329 and 603.)

GRINDERS, Disc

Besly & Co., Charles H., 118-24 N. Clinton St., Chicago, Ill.

Bridgeport Engineering Co., Bridgeport, Conn.

Diamond Machine Co., Providence, R. I.

Gardner Machine Co., 410 Bushnell St., Beloit, Wis.

Hoysradt & Case, 131 Cornell St., Kingston, N. Y.

Ransom Mfg. Co., 320 Eighth St., Oshkosh, Wis.

Rowbottom Machine Co. (Waterville), Waterbury, Conn.

Taylor & Fenn Co., 54-70 Arch St., Hartford, Conn.

Valley City Machine Works, 12-16 Campau Ave., Grand Rapids, Mich.

GRINDERS, Drill

Morse Twist Drill & Machine Co., New Bedford, Mass.

New Yankee—See Wilmarth & Morman Co.

Sellers & Co., Wm., 1600 Hamilton St., Philadelphia, Pa.

Washburn Shops, Boynton St., Worcester, Mass. "Worcester."

Wilmarth & Morman Co., 1179 Monroe Ave., N. W., Grand Rapids, Mich. "New Yankee."

Worcester—See Washburn Shops.

GRINDERS, ELECTRIC PORTABLE—See Drills, Electric Portable

GRINDERS, Internal

Brown & Sharpe Mfg. Co., Promenade St., Providence, R. I.

Cincinnati Grinder Co., Colerain & Alabama Aves., Cincinnati, O.

Conover-Overkamp Machine & Tool Co., 841 W. Germantown St., Dayton, O.

Heald Machine Co., 22 New Bond St., Worcester, Mass.

Landis Tool Co., Waynesboro, Pa. (See page 331.)

Modern Tool Co., Fourth & State Sts., Erie, Pa.

Rivett Lathe & Grinder Co., 1 Brooks St. (Brighton), Boston, Mass.

Schmidt Co., B. L., Davenport, Ia. (See page 243.)

Thompson Grinder Co., Main & Murray Sts., Springfield, O.

Universal Grinding Machine Co., Walnut St., Fitchburg, Mass.

Van Norman Machine Tool Co., Wilbraham Ave., Springfield, Mass.

GRINDERS, Piston Ring

Alert—See Harding, S. B.

Bay State Grinder Co., 98 Beacon St., Worcester, Mass.

Bristol Machine Tool Co., 151 Riverside Ave., Bristol, Conn.

Harding, S. B., Waukesha, Wis. "Alert."

Heald Machine Co., 22 New Bond St., Worcester, Mass.

GRINDERS, Plain Tool

American Grinder Mfg. Co., 2203 Sycamore St., Milwaukee, Wis.

Athol Machine Co., Athol, Mass.

Baird Machine Co., Stratford Ave., Bridgeport, Conn.

Blount Co., J. G., Everett, Mass. (See page 387.)

Brown & Sharpe Mfg. Co., Promenade St., Providence, R. I.

Builders Iron Foundry, 9 Codding St., Providence, R. I.

Canton Foundry & Machine Co., Third St. & Savannah Ave., S. E., Canton, O. "Universal."

Clizbe Bros. Mfg. Co., Plymouth, Ind. "Crown," "Queen," "Imperial," "Plymouth."

Crown—See Clizbe Bros. Mfg. Co.

Diamond Grinder Mfg. Co., 6 E. Lake St., Chicago, Ill.

Diamond Machine Co., Providence, R. I.

Ferrodowill Mfg. Co., 217 W. Indiana Ave., St. Paul, Minn.

Fitchburg Grinding Machine Co., 76 Winter St., Fitchburg, Mass.

Fry Mfg. Co., B. L., Ninth & Monroe Sts., St. Louis, Mo.

Imperial—See Clizbe Bros. Mfg. Co.

La Salle Machine & Tool Co., 505 Second St., La Salle, Ill.

Landis Tool Co., Waynesboro, Pa. (See page 331.)

Luther Grinder Mfg. Co., Milwaukee, Wis.

Modern Tool Co., Fourth & State Sts., Erie, Pa.

Norton Grinding Co., New Bond St., Worcester, Mass.

Oesterlein Machine Co., 2850 Spring Grove Ave., Cincinnati, O. "Ohio."

Ohio—See Oesterlein Machine Co.

Otis Machine Works, 191 Mill St., Rochester, N. Y.

Partridge, E. O., 2047 W. Lake St., Chicago, Ill.

Plymouth—See Clizbe Bros. Mfg. Co.

Queen—See Clizbe Bros. Mfg. Co.

Ransom Mfg. Co., 320 Eighth St., Oshkosh, Wis.

Royersford Foundry & Machine Co., Royersford, Pa.

St. Louis Machine Tool Co., 922-32 Loughborough Ave., St. Louis, Mo. "Western."

Stapf & Co., John B., Dunkirk, N. Y.

Star Specialty Mfg. Co., 227-33 W. Erie St., Chicago, Ill.

Tabor Mfg. Co., 1740 Hamilton St., Philadelphia, Pa. "Taylor."

Taylor—See Tabor Mfg. Co.

U. S. Electrical Mfg. Co., 459 E. Third St., Los Angeles. Cal.

Universal—See Canton Foundry & Machine Co.

Valley City Machine Works, 12-16 Campau Ave., Grand Rapids, Mich.

Walker Grinder Co., Worcester, Mass.

Webster & Perks Tool Co., Springfield, O.

Western—See St. Louis Machine Tool Co.

GRINDERS, Reamer and Cutter

Brown & Sharpe Mfg. Co., Promenade St., Providence, R. I.

Cincinnati Milling Machine Co., Columbia Rd., Cincinnati, O.

Clough, R. M., Tolland, Conn.

Conover-Overkamp Machine & Tool Co., 841 W. Germantown St., Dayton, O.

Greenfield Machine Co., Greenfield, Mass.

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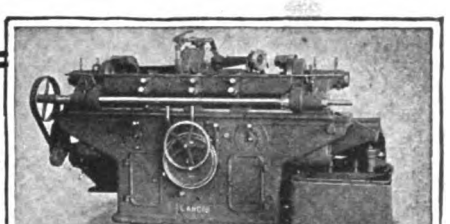

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GRINDERS, Reamer and Cutter (Continued)

Ingersoll Milling Machine Co., Rockford, Ill.
Le Blond Machine Tool Co., R. K., 4609-21 Eastern Ave. (Linwood), Cincinnati, O.
Oesterlein Machine Co., 2850 Spring Grove Ave., Cincinnati, O. "Ohio."
Ohio—See Oesterlein Machine Co.
Thompson Grinder Co., Main & Murray Sts., Springfield, O.
Universal Grinding Machine Co., Walnut St., Fitchburg, Mass.
Wilmarth & Morman Co., 1179 Monroe Ave., N. W., Grand Rapids, Mich.
Woods Engineering Co., 108 E. Patterson St., Alliance, O.

GRINDERS, RING—See Grinders, Piston Ring

GRINDERS, Surface

Bay State Grinder Co., 98 Beacon St., Worcester, Mass.
Blanchard Machine Co., 64 State St., Cambridge, Mass.
Bristol Machine Tool Co., 151 Riverside Ave., Bristol, Conn.
Brown & Sharpe Mfg. Co., Promenade St., Providence, R. I.
Conover-Overkamp Machine & Tool Co., 841 W. Germantown St., Dayton, O.
Diamond Machine Co., Providence, R. I.
Garvin Machine Co., Spring & Varick Sts., New York, N. Y.
Heald Machine Co., 22 New Bond St., Worcester, Mass.
La Salle Machine & Tool Co., 505 Second St., La Salle, Ill.
Landis Tool Co., Waynesboro, Pa. (See page 331.)
Persons-Arter Machine Co., 72 Commercial St., Worcester, Mass.
Pratt & Whitney Co., 111 Broadway, New York, N. Y. (See page 73.)
Springfield Mfg. Co., 317 Mt. Grove St., Bridgeport, Conn.
Thompson Grinder Co., Main & Murray Sts., Springfield, O.
Universal Grinding Machine Co., Walnut St., Fitchburg, Mass.
Valley City Machine Works, 12-16 Campau Ave., Grand Rapids, Mich.
Wilmarth & Morman Co., 1179 Monroe Ave., N. W., Grand Rapids, Mich.

GRINDERS, Swing Frame

Pittsburgh Grinding Wheel Co., Rochester, Pa.
Safety Emery Wheel Co., Springfield, O.
Springfield Mfg. Co., 317 Mt. Grove St., Bridgeport, Conn.
Tucker Machine Co., 222 E. Ninth St., Cincinnati, O.

GRINDERS, Universal

American Tool & Machine Co., Boston, Mass.
Brown & Sharpe Mfg. Co., Promenade St., Providence, R. I.
Cincinnati Grinder Co., Colerain & Alabama Aves., Cincinnati, O.
Conover-Overkamp Machine & Tool Co., 841 W. Germantown St., Dayton, O.
Landis Tool Co., Waynesboro, Pa. (See page 331.)
Modern Tool Co., Fourth & State Sts., Erie, Pa.
Norton Grinding Co., New Bond St., Worcester, Mass.
Thompson Grinder Co., Main & Murray Sts., Springfield, O.
Universal Grinding Machine Co., Walnut St., Fitchburg, Mass.
Wilmarth & Morman Co., 1179 Monroe Ave., Madison, Wis.

GRINDERS, VALVE—See Machines, Valve Seating; also Tools, Valve Grinding

GRINDERS, Wet Tool

Blount Co., J. G., Everett, Mass. (See page 387.)
Bridgeport Safety Emery Wheel Co., 82 Knowlton St., Bridgeport, Conn.
Diamond Machine Co., Providence, R. I.
Gisholt Machine Co., 1315 E. Washington Ave., Madison, Wis.
Hoysradt & Case, 131 Cornell St., Kingston, N. Y.
Leland-Gifford Co., 1025 Southbridge St., Worcester, Mass.
Lutter & Gies Co., 258 Lake St., Milwaukee, Wis. "Milwaukee."
Milwaukee—See Lutter & Gies.
Ransom Mfg. Co., 320 Eighth St., Oshkosh, Wis.
Sellers & Co., Wm., 1600 Hamilton St., Philadelphia, Pa.
Springfield Mfg. Co., 317 Mt. Grove St., Bridgeport, Conn.
Sterling Grinding Wheel Co., Tiffin, O.
Taylor & Fenn Co., 54-70 Arch St., Hartford, Conn.
Tucker Machine Co., 222 E. Ninth St., Cincinnati, O.
Valley City Machine Works, 12-16 Campau Ave., Grand Rapids, Mich.
Webster & Perks Tool Co., Springfield, O.

GRIPS, Aeroplane Rubber

Dural Rubber Corp., Maple Ave., Flemington, N. J.

GRIPS, NON-SKID—See Chains or Grips, Tire; also Bands, Non-Skid

GRIPS, Pedal

(Rubber pads for applying to clutch and brake pedals to prevent feet from slipping)

Auto Pedal Pad Co., 794 Seventh Ave., New York, N. Y. "Perfection."
Cushion Pedal Co., Los Angeles, Cal. "Mason-Allen."
Mason-Allen—See Cushion Pedal Co.
Mattson Rubber Co., Lodi, N. J.
Perfection—See Auto Pedal Pad Co.
Rich Mfg. Co., 1777 Broadway, New York, N. Y. "Rico." (See page 277.)
Rico—See Rich Mfg. Co.
Rives Mfg. Co., Geo. H., 233 Broadway, New York, N. Y.

GRIPS, Pedal, for Fords

(Rubber pads for applying to pedals to prevent feet from slipping)

Apco Mfg. Co., Eddy St., Providence, R. I.
Auto Pedal Pad Co., 794 Seventh Ave., New York, N. Y.
Evergood—See Grossman Mfg. Corp.
Grant Auto Appliance Co., 819 14th St., Denver, Colo. "Nonslip," "Rubbertop."
Grossman Mfg. Corp., Emil, Bush Terminal Bldg. No. 20, Brooklyn, N. Y. "Evergood."

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GRIPS, Pedal, for Fords (Continued)

Hill Pump Valve Co.—See Zinke Co.
Mattson Rubber Co., Lodi, N. J.
Nonslip—See Grant Auto Appliance Co.
Rich Mfg. Co., 1777 Broadway, New York, N. Y. "Rico." (See page 277.)
Rico—See Rich Mfg. Co.
Rives Mfg. Co., Geo. H., 233 Broadway, New York, N. Y.
Rubbertop—See Grant Auto Appliance Co.
Utility—See Zinke Co.
Zinke Co., 1323-25 Michigan Ave., Chicago, Ill. (Sole Distributors for Hill Pump Valve Co., Chicago, Ill. "Utility.") (See page 551.)

GRIPS, Spark and Throttle Lever

(Rubber or Composition Grips or Handles for Spark and Throttle Levers)

American Hard Rubber Co., 9 Mercer St., New York, N. Y.
Luzerne Rubber Co., Trenton, N. J.
Stokes Rubber Co., Jos., Trenton, N. J.

GRIPS, Spark and Throttle Lever, for Fords

Hasco—See Howard Auto Specialties Co.
Howard Auto Specialties Co., Swampscott, Mass., "Hasco."

GRIPS, STEERING WHEEL—See Covers, Steering Wheel

GUARDS, Horn Bulb

(Metal Stamping to prevent rubber horn bulbs from being easily damaged)

Asco—See New York Wire & Spring Co.
New York Wire & Spring Co., 586-88 Washington St., New York, N. Y. "Asco." (See page 641.)

GUARDS, Motorcycle Chain

International Stamping Co., 400-12 N. Leavitt St., Chicago, Ill.

GUARDS, Motorcycle Mud

International Stamping Co., 400-12 N. Leavitt St., Chicago, Ill.

GUARDS, MUD—See Fenders

GUARDS, RADIATOR—See Fenders or Guards, Truck Radiator

GUIDES, BELT, FOR FORDS—See Guides, Fan Belt

GUIDES, BRAKE ROD, FOR FORDS—See Supports, Brake Rod

GUIDES, Fan Belt, for Fords

(To prevent belt slipping off pulley)

Apco Mfg. Co., Eddy St., Providence, R. I.
Home Light Co., 3353 Milwaukee Ave., Chicago, Ill.
Humboldt Machine & Stamping Co., 81-85 Tenth St., Long Island City, N. Y.
Martens Co., E. A., Ninth & Main Sts., Lafayette, Ind.
Metal Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.
Mosco—See Motor Specialties Co.
Motor Specialties Co., Pine St., Waltham, Mass. "Mosco."
Pedersen Lubricator Co., 636 First Ave., New York, N. Y. "Stay-On."
Stay-On—See Pedersen Lubricator Co.

GUIDES, ROAD—See Maps, Road

GUN LOADERS—See Loaders, Grease Gun

GUN METAL FINISH—See Treating, Heat; also Enamels, Lacquers and Finishes, Brass

GUNS, Grease

Aetna Rubber Co., 815 E. 79th St., Cleveland, O. "Horton."
Agner Simplex Co.—See Hinrichs Mfg. Co.
Attwood Brass Works, Grand Rapids, Mich. (See page 531.)
Avery Portable Lighting Co., 351 National Ave., Milwaukee, Wis.
Bell Pump & Mfg. Co., 74-78 Fort St., E., Detroit, Mich.
Big Dane—See Miller & Starr Co.
Boe Co., H. M., 2416 University Ave., S. E., Minneapolis, Minn. (See page 335.)
Boston—See Randall-Faichney Co.
Boyd & Richardson, Ashton, Ill.
Bridgeport Brass Co., E. Main St., Bridgeport, Conn.
Brown Co., 213 Bellevue Ave., Syracuse, N. Y.
Dilley, A. J., Muir, Mich.
Edelmann & Co., E., 341-63 E. Ohio St., Chicago, Ill. "Gem," "Jumbo."
Ekern Bros. Mfg. Co., Flandreau, S. Dak.
Essex Brass Co., G. B., 480-86 Franklin St., Detroit, Mich.
Gem—See Edelmann & Co.
Generator Valve Co., 47 Dinsmore Pl., Brooklyn, N. Y. "James."
Gleason-Peters Air Pump Co., 384 Classon Ave., Brooklyn, N. Y.
Golden—See Rowe Co.
Haney & Co., J. H., Hastings, Neb. "Rose."
Harris Hdw. & Mfg. Co., D. P., 24-26 Murray St., New York, N. Y. "Rollfast."
Harris Mfg. Co., D. P., Reading, Pa.
Hinrichs Mfg. Co., 115 S. Dearborn St., Chicago, Ill. (Sole Distributors for Agner Simplex Co., Burlington, Wis.) "Simplex."
Horton—See Aetna Rubber Co.
James—See Generator Valve Co.
Judd & Leland Mfg. Co., Clifton Springs, N. Y. "Victor." (See page 535.)
Jumbo—See Edelmann & Co.
Kellogg Mfg. Co., Rochester, N. Y. (See page 533.)
Mann Corp., Kankakee, Ill.
Midway Mechanical Co., 1555 Selby Ave., St. Paul, Minn.
Miller & Starr Co., 250 Green St., Brooklyn, N. Y. "Big Dane."
Noera Mfg. Co., 21-97 Griggs St., Waterbury, Conn.
Only Grease Gun Co., Jefferson, Ia.
P. D. Q.—See Star Brass Works.
Pioneer—See Stevens & Co.
Pretzel, Herman H., Stillwater, Minn.
Protex Mfg. Co., 13-17 N. Jefferson St., Chicago, Ill. (See page 275.)
Randall-Faichney Co., 76 Atherton St. (Jamaica Plain), Boston, Mass. "Boston."
Rollfast—See Harris Hdw. & Mfg. Co.
Rose—See Haney & Co.
Rowe Co., Jas. C., 710 E. Baltimore St., Baltimore, Md. "Golden."

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"Brains in the Rear Axle"

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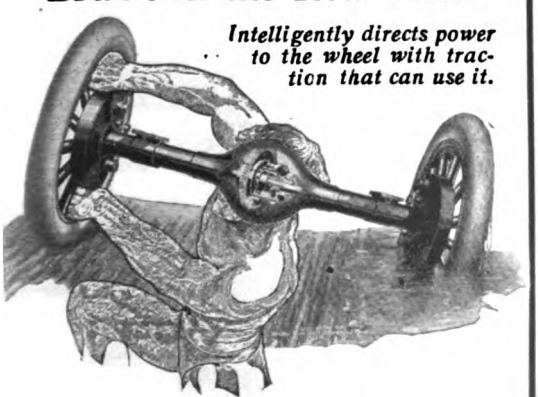

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GUNS, Grease (Continued)

Runyen Mfg. Co., 40-50 Market Ave., N. W., Grand Rapids, Mich.
Shields—See Wheless-Wilson Auto Supply Co.
Sidel-Rattner Mfg. Co., 31-35 Broadway, Brooklyn, N. Y. "Wonder Minute."
Simplex—See Hinrichs Mfg. Co.
Star Brass Works, 2623 McGee Ave., Kansas City, Mo. "P. D. Q."
Stevens & Co., 375 Broadway, New York, N. Y. "Pioneer."
Toomey Grease Gun Co., Edmore, N. Dak.
Townsend & Co., S. P., 15 Central Ave., West Orange, N. J.
Universal Specialty Co., 1405-07 S. Seventh St., St. Louis, Mo.
Victor—See Judd & Leland Mfg. Co.
Vital Mfg. Co., 7507 Quincy St., Cleveland, O.
Warren Refining & Chemical Co., Cleveland, O.
Warren & Anderson, 404 Boston Blk., Minneapolis, Minn. "Ekern."
Weaver Mfg. Co., 2173 S. Ninth St., Springfield, Ill.
Wetco—See Wetherholt Co.
Wetherholt Co., 20 E. Jackson Blvd., Chicago, Ill. "Wetco."
Wheless-Wilson Auto Supply Co., Shreveport, La. "Shields."
Wonder Minute—See Sidel-Rattner Mfg. Co.

GUNS, Oil

Agner Simplex Co.—See Hinrichs Mfg. Co.
Bell Pump & Mfg. Co., 74-78 Fort St., E., Detroit, Mich.
Blue Ribbon Mfg. Co., 27 Baldwin St. (Charlestown), Boston, Mass. "Premium."
Bridgeport Brass Co., E. Main St., Bridgeport, Conn.
Copley—See Randall-Faichney Co.
Edelmann & Co., E., 341-63 E. Ohio St., Chicago, Ill. "Gem."
Essex Brass Co., G. B., 480-86 Franklin St., Detroit, Mich.
Gem—See Edelmann & Co.
Gleason-Peters Air Pump Co., 384 Classon Ave., Brooklyn, N. Y.
Hancock Mfg. Co., 770 Henry St., Charlotte, Mich.
Haney & Co., J. H., Hastings, Neb.
Hinrichs Mfg. Co., 115 S. Dearborn St., Chicago, Ill. (Sole Distributors for Agner Simplex Co., Burlington, Wis.)
Judd & Leland Mfg. Co., Clifton Springs, N. Y. (See page 535.)
Kellogg Mfg. Co., Rochester, N. Y. (See page 533.)
McRae & Roberts Co., 211-35 Campbell Ave., Detroit, Mich.
Noera Mfg. Co., 21-97 Griggs St., Waterbury, Conn.
Premium—See Blue Ribbon Mfg. Co.
Protex Mfg. Co., 13-17 N. Jefferson St., Chicago, Ill. (See page 275.)
Randall-Faichney Co., 76 Atherton St. (Jamaica Plain), Boston, Mass. "Copley."

HACK SAW FRAMES—See Frames, Hack Saw

HACK SAW MACHINES—See Saws, Power Hack

HAIR PICKING MACHINES—See Machines, Hair Picking

HAIR, Upholstery

(For Upholstery Moss—See Moss, Upholstery; for Upholstery Felt—See Felt, Upholstery)

Armour Curled Hair Works, 31st Pl. & Benson Sts., Chicago, Ill.
Bentley Hair Co., Joseph, Pelham Ave., Methuen, Mass.
Burnham Mfg. Co., 210 River St., Burnham, Ill.
Chicago Curled Hair Co., 2301-23 S. Paulina St., Chicago, Ill.
Cudahy Curled Hair Works, 111 W. Monroe St., Chicago, Ill.
Delany & Co., 209 N. Third St., Philadelphia, Pa.
Gordon Bros., Pierce & Orthodox Sts. (Frankford), Philadelphia, Pa.
Mitchell Co., P. R., Spring Grove & Harrison Aves., Cincinnati, O.
Morris & Co., U. S. Yards, Chicago, Ill.
Walpert & Co., Fred, 106-108 N. Gay St., Baltimore, Md.
Wilkens Co., Wm., Frederick Ave. & Wilkens St., Baltimore, Md.
Wilson & Co., Thos., 43d St. & Ashland Ave., Chicago, Ill.
Woll & Co., F. P., Church & Tacony Sts. (Frankford), Philadelphia, Pa.
Woll & Sons Mfg. Co., Peter, Hancock & Berks Sts., Philadelphia, Pa.

HAMMERS, Brass and Copper

Electric Materials Co., North East, Pa.
Eureka Co., North East, Pa.
Goodell-Pratt Co., Greenfield, Mass. (See page 751.)
Union Hardware Co., Torrington, Conn.
Williams & Son, E. A., 105-11 Plymouth St., Jersey City, N. J.

HAMMERS, COPPER—See Hammers, Brass

HAMMERS, Machinists

Atha Tool Co., Chapel St., Newark, N. J.
Beall Bros., Fourth St., Alton, Ill.
Billings & Spencer Co., Laurel & Park Sts., Hartford, Conn.
Buffum Tool Co., Louisiana, Mo. (See page 707.)
Cheney Hammer Co., H., Little Falls, N. Y.
Evansville Tool Works, Ninth Ave. & Maryland St., Evansville, Ind.
Fairmount Tool & Forging Co., 10585 Quincy Ave., Cleveland, O.
Heller Bros. Co., 865 Mt. Prospect Ave., Newark, N. J.
Hyde Park Mfg. Co., Bernharts, Pa.
Maydole Hammer Co., David, 45-61 Lackawanna Ave., Norwich, N. Y.
Peck, Stow & Wilcox Co., Southington, Conn "Pexto."
Perfect Handle—See Smith & Co.
Pexto—See Peck, Stow & Wilcox Co.
Smith & Co., H. D., Plantsville, Conn. "Perfect Handle."
Vaughan & Bushnell Mfg. Co., 2114-28 Carroll Ave., Chicago, Ill.
Vichek Tool Co., 10709 Quincy Ave., Cleveland, O.
Warner Hammer Co., Cromwell, Conn.

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Billings, Montana		Accessory Sales Co.
Boston, Mass.	191 Massachusetts Ave.	The John V. Wilson Co.
Chicago, Ill.	2204 Michigan Ave.	The Bearings Co. of Pennsylvania
Chicago, Ill.	2636 Michigan Ave.	Ahlberg Bearing Company
Chicago, Ill.	39 So. Clinton St.	Reeves Pulley Co.
Cincinnati, Ohio	8th and Main Sts.	I. J. Cooper Rubber Co.
Cleveland, Ohio	500 Prospect Ave.	The M & M Company
Columbus, Ohio	142 East Gay St.	I. J. Cooper Rubber Co.
Dallas, Texas	Commerce and Harwood Sts.	The Fisk Co. of Texas
Dayton, Ohio	12-20 North Jefferson St.	I. J. Cooper Rubber Co.
Des Moines, Iowa	506 West 7th St.	Bernhard & Turner Automobile Co.
Houston, Texas	1120 Main St.	The Fisk Co. of Texas
Indianapolis, Ind.	Cor. Capitol and Vermont Sts.	I. J. Cooper Rubber Co.
Kansas City, Mo.	1522 Grand Ave.	The Equipment Co.
Los Angeles, Cal.	1406 West Pico St.	The Pacific Ball Bearing Co.
Macon, Ga.	Second and Poplar Sts.	S. S. Parmelee Company
Minneapolis, Minn.	111 South 5th St.	Fenstermacher Auto Supply Co.
New York, N. Y.	61st St. at Broadway	A. J. Picard & Co.
New York, N. Y.	60th St. and Broadway	S. Fabian Goodman
New York, N. Y.	1864 Broadway	The Bearings Co.
Oklahoma City, Okla.	406 N. Broadway	Sharp Auto Supply Co.
Omaha, Neb.	1920 Farnam St.	Western Automobile Supply Co.
Philadelphia, Pa.	684 No. Broad St.	The Bearings Co. of Pennsylvania
Pittsburgh, Pa.	600 Grant Boulevard	The Dyke Motor Supply Co.
Providence, R. I.	83 Weybosset St.	The Belcher & Loomis Hardware Co.
Providence, R. I.	64 Exchange Place	Waite Auto Supply Co.
Salt Lake City, Utah	115-117 South West Temple	Motor Mercantile Company
San Antonio, Texas	204 Avenue C	The Fisk Co. of Texas
San Francisco, Cal.	60 Pine St.	The F. Somers Peterson Co.
San Jose, Cal.	241 So. First St.	Campbell-Collins Co.
Spokane, Wash.	1021 Sprague Ave.	The Washington Magneto Exch.
Vancouver, B. C.	1560 Thirteenth Ave.	Maritime Motor Car Co.

Distributor for Australasia
Colonial Trading Co., Prop. Ltd., Elizabeth St., Melbourne, Australia
Distributors for Brazil
Companhia Commercial E Maritima, Rio De Janeiro
Export Agents for France and Italy
J. E. Dockendorff & Company, 20 Broad St., New York, N. Y.

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HAMMERS, Power

Beaudry & Co., 141 Milk St., Boston, Mass. "Champion," "Peerless."
Beche—See Nazel Engineering & Machine Works.
Billings & Spencer Co., Laurel & Park Sts., Hartford, Conn.
Bliss Co., E. W., 29 Adams St., Brooklyn, N. Y.
Bradley & Son, C. C., 432 N. Franklin St., Syracuse, N. Y.
Champion—See Beaudry & Co.
Champion Blower & Forge Co., Harrison Ave., Lancaster, Pa.
Dienelt & Eisenhardt, 1304-18 N. Howard St., Philadelphia, Pa.
Justice & Co., P. S., 617 Chestnut St., Philadelphia, Pa.
Little Giant Co., 199 Rock St., Mankato, Minn. (See page 59.)
McLane, J. B., North Reading, Mass.
MacGowan & Finigan Foundry & Machine Co., St. Louis, Mo. "Perfect."
Massillon Foundry & Machine Co., Massillon, O.
Merrill Bros., 3 Arnold St., Maspeth, N. Y.
Nazel Engineering & Machine Works, 4043 N. Fifth St., Philadelphia, Pa. "Beche."
Niles-Bement-Pond Co., 111 Broadway, New York, N. Y.
Peerless—See Beaudry & Co.
Perfect—See MacGowan & Finigan Foundry & Machine Co.
Pettingell Machine Co., 79 Elm St., Amesbury, Mass.
Quickwork—See Smith, H. Collier.
Scranton & Co., 42 Church St., New Haven, Conn.
Smith, H. Collier, 807-15 Scotten Ave., Detroit, Mich. "Quickwork."
Toledo Machine & Tool Co., 1736 Dorr St., Toledo, O.
Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.
Williams, White & Co., Third Ave. & Euclid St., Moline, Ill.

HAMMERS, RUBBER—See Mallets, Rubber

HAMMERS, Steam

Alliance Machine Co., Alliance, O.
Bell—See Buffalo Foundry & Machine Co.
Bement—See Niles-Bement-Pond Co.
Buffalo Foundry & Machine Co., 1541 Fillmore Ave., Buffalo, N. Y. "Bell."
Chambersburg Engineering Co., Derbyshire St., Chambersburg, Pa.
Erie Foundry Co., 12th & Cranberry Sts., Erie, Pa.
McDougall & Potter Co., 606 W. 55th St., New York, N. Y.
Massillon Foundry & Machine Co., Massillon, O.
Morgan Engineering Co., Alliance, O.
Niles-Bement-Pond Co., 111 Broadway, New York, N. Y. "Bement."

HAMMOCKS, Baby

Gordon Motor Crib Co., 27 W. South Water St., Chicago, Ill.
Hilton Auto Babynest Co., American Bank Bldg., Seattle, Wash.
Perfection Mfg. Co., 2710 N. Leffingwell Ave., St. Louis, Mo. "Rock-a-Bye." (See page 659.)
Rock-a-Bye—See Perfection Mfg. Co.

HAMPERS, BASKETS and LUNCH BOXES, Touring

(See also Trunks, Automobile; also Stoves, Camp)

Berg Auto Trunk & Specialty Co., 400 Lafayette St., New York, N. Y. "Campo."
Burlington Basket Co., 600 N. Main St., Burlington, Ia. "Hawkeye."
Campo—See Berg Auto Trunk & Specialty Co.
Globe Machine & Stamping Co., 1250 W. 76th St., Cleveland, O.
Hartwell, R. W., 314 Rusholm St., Davenport, Ia.
Hawkeye—See Burlington Basket Co.
Knickerbocker Case Co., Fulton & Clinton Sts., Chicago, Ill.
Moats—See Prentiss-Wabers Mfg. Co.
Orne Auto Diner Co., Everett, Wash.
Prentiss-Wabers Mfg. Co., 20 Spring St., Grand Rapids, Mich. "Moats."
Refrigo Auto Chest Co., Iron River, Mich.
Seitz, C., 275 W. 128th St., New York, N. Y.
Warren Leather Goods Co., Worcester, Mass

HAND CLAMPS—See Clamps

HAND HORNS—See Horns, Mechanical

HAND LAMPS—See Lamps, Electric Hand

HAND LANTERNS—See Lights, Electric Flash

HAND PASTE—See Soaps, Hand

HAND PUMPS—See Pumps, Hand

HAND PUNCHES—See Punches, Portable Hand

HAND SCREW MACHINES—See Machines, Screw

HAND SOAPS—See Soaps, Hand

HAND WOUND CLOCKS—See Clocks, Hand Wound

HANDLE BARS, MOTORCYCLE — See Bars, Motorcycle Handle

HANDLES, Car Door

Aetna Brass Mfg. Co., 1633 E. 55th St., Cleveland, O.
American Brass Novelty Co., Grand Haven, Mich.
Attwood Brass Works, Grand Rapids, Mich. (See page 531.)
Bassick Co., 38 Austin St., Bridgeport, Conn.
Chicago Cabinet Lock Co., Lake View, Chicago, Ill. (See page 419.)
Cowles & Co., C., New Haven, Conn. (See page 339.)
Douglas & Lomason Co., 642 Lincoln Ave., Detroit, Mich.
Electro—See Hughes & Co.
English & Mersick Co., New Haven, Conn. (See page 573.)
Enterprise Brass & Plating Co., Sixth & Raymiller Sts., Cincinnati, O.
Ferro Stamping & Mfg. Co., 287-97 Franklin St., Detroit, Mich.
Hughes & Co., D. C., 4642-44 Ravenswood Ave., Chicago, Ill. "Electro."
Imperial Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill. (See page 733.)

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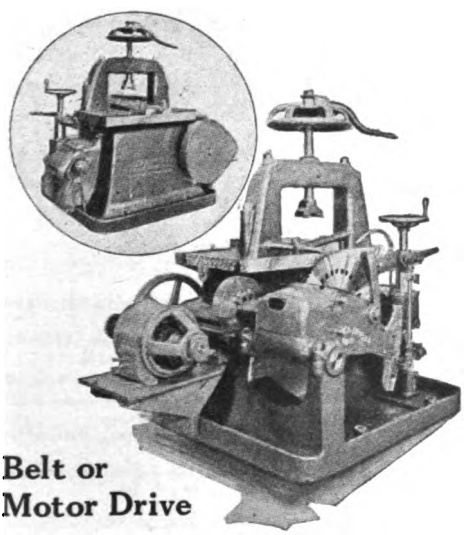

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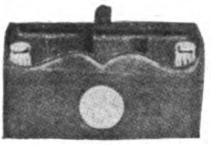

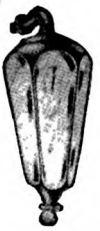

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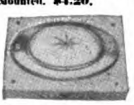

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HANDLES, Car Door (Continued)

Jonah & George, Merrimac, Mass.
Keeler Brass Co., 261-71 Godfrey Ave., Grand Rapids, Mich.
Mitchell Specialty Co., Market & 18th Sts., Philadelphia, Pa.
O'Brien Mfg. Co., Joseph F., 391 Broadway, New York, N. Y.
Ochsner & Sons Co., A., 1060 State St., New Haven, Conn.
Phoenix Lock Works, 321-27 Third Ave., Newark, N. J.
Sargeant Mfg. Co., New & Summit Sts., Newark, N. J.
Smith & Co., Jos. N., E. Grand Blvd. & Dubois St., Detroit, Mich.
White Mfg. Co., 155 Cannon St., Bridgeport, Conn.
Woodruff & Sons Co., Walter W., Mount Carmel, Conn.

HANDLES, CRANK—See Handles, Starting Crank

HANDLES, DOOR—See Handles, Car Door

HANDLES, Starting Crank

(Rubber, Composition or Fibre Handles for Starting Cranks)

American Hard Rubber Co., 9 Mercer St., New York, N. Y.
American Vulcanized Fibre Co., Equitable Bldg., Wilmington, Del.
Continental Fibre Co., Newark, Del. (See page 199.)
Diamond State Fibre Co., Bridgeport, Pa.
Luzerne Rubber Co., Trenton, N. J.
Mechanical Rubber Co., C. P. & Nickel Plate R. R., Cleveland, O.
National Fibre & Insulation Co., Yorklyn, Del. (See page 285.)
Stokes Rubber Co., Jos., Trenton, N. J.
Wilmington Fibre Specialty Co., Wilmington, Del. (See page 285.)

HANGERS and HINGES, Garage Door

Allith-Prouty Co., Danville, Ill. (See page 351.)
Cloztite—See Wagner Mfg. Co.
Coburn Trolley Track Mfg. Co., Blanche St., Holyoke, Mass.
Lane Bros. Co., 48 Prospect St., Poughkeepsie, N. Y.
Louden Machinery Co., 7504 Court St., Fairfield, Ia.
Myers & Bro. F. E., 1000 Orange St., Ashland, O.
Richards-Wilcox Mfg. Co., Third St. & C. B. & Q. R. R. Tracks, Aurora, Ill. "Slidetite."
Slidetite—See Richards-Wilcox Mfg. Co.
Stanley Works, New Britain, Conn. (See page 347.)
Wagner Mfg. Co., Cedar Rapids, Ia. "Cloztite."

HANGERS, Hat

(Clip for hanging hats on robe rails—See also Racks, Hat)

Buckeye—See Central Brass & Fixture Co.
Central Brass & Fixture Co., Dept. A., Springfield, O. "Buckeye." (See page 137.)
Stadeker Metal Specialty Co., 358 W. Madison St., Chicago, Ill. (See page 271.)

HANGERS, LICENSE — See Holders, License; also Numbers, License

HANGERS, Pressed Steel Step

(Pressed Steel Step or Running Board Hangers or Brackets; for Forged Hangers—See Forgings, Drop)

Bossert Corp., Utica, N. Y. (See page 363.)
Buffalo Pressed Steel Co., Buffalo, N. Y. (See page 473.)
Crosby Co., Buffalo, N. Y. (See page 669.)
Detroit Pressed Steel Co., Detroit, Mich. (See page 365.)
Forsyth Bros., McCormick Bldg., Chicago, Ill.
Globe Machine & Stamping Co., 1250 W. 76th St., Cleveland, O.
Hydraulic Pressed Steel Co., 3180 E. 61st St., Cleveland, O. (See page 297.)
Parish Mfg. Co., Reading, Pa. (See page 541.)
Rochester Pressed Steel Co., 35-37 Ford St., Rochester, N. Y.

HANGERS, STEP—See Hangers, Pressed Steel Step

HARD RUBBER—See Rubber, Hard

HARDENING COMPOUNDS — See Compounds, Case Hardening

HARDENING FURNACES—See Furnaces, Annealing and Case Hardening

HARDENING MATERIALS — See Compounds, Case Hardening

HARDENING, METAL—See Treating, Heat

HARDNESS TESTING INSTRUMENTS — See Instruments, Metal Testing

HARNESS WIRING FOR FORDS—See Sets, Wiring

HASSOCKS, Automobile

(For Metal Foot Rests—See Rests, Foot)

Chicago Hassock Co., 1731 S. State St., Chicago, Ill.

HAT HANGERS—See Hangers, Hat

HAT RACKS—See Racks, Hat

HATS, MOTORISTS—See Caps, Motorists

HEADLIGHT BRACKETS—See Brackets, Automatic Headlight

HEADLIGHT BULBS—See Lamps, Miniature Incandescent

HEADLIGHT DIMMERS—See Dimmers or Shades, Headlight

HEADLIGHT REFLECTORS—See Reflectors, Headlight

HEADLIGHT REGULATORS FOR FORDS —See Regulators, Electric Light

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HEADLIGHT SHADES—See Dimmers or Shades, Headlight

HEADLIGHTS, ACETYLENE—See Lamps, or Headlights, Acetylene

HEADLIGHTS, Electric

(See also Lamps, Electric; for Acetylene Headlights—See Lamps, Acetylene)

Adams-Bagnall Electric Co., 7209 Platt St., Cleveland, O.

American Auto Lamp Co., 20 Desbrosses St., New York, N. Y.

B & L Auto Lamp Co., 103-05 Mott St., New York, N. Y. (See page 487.)

Brown Mfg. Co., John W., Columbus, O. (See page 381.)

E & J—See Edmunds & Jones Corp.

Edmunds & Jones Corp., 436 Lawton Ave., Detroit, Mich. "E. & J."

Guide Motor Lamp Mfg. Co., Madison Ave., Cleveland, O.

Hall Lamp Co., C. M., Rivard & Hancock Sts., Detroit, Mich. "Solar." (See page 385.)

Hammer Co., E. A., 1839 Euclid Ave., Cleveland, O.

Hawthorne Mfg. Co., 35 Spruce St., Bridgeport, Conn. "Old Sol."

K-D Lamp Co., Cincinnati, O. (See page 381.)

Old Sol—See Hawthorne Mfg. Co.

Solar—See Hall Lamp Co.

Vesta Accumulator Co., 2100 Indiana Ave., Chicago, Ill.

HEADLIGHTS, ELECTRIC FOR FORDS—See Lamps, Electric Head

HEADLIGHTS, Tractor Acetylene

American Acetylene Stove Co., 504 Masonic Temple, Minneapolis, Minn.

Corcoran-Victor Co., 712 Reading Rd., Cincinnati, O.

Hall Lamp Co., C. M., Rivard & Hancock Sts., Detroit, Mich. "Solar." (See page 385.)

Indiana Lamp Co., Connersville, Ind. (See pages 546 and 547.)

Solar—See Hall Lamp Co.

Superior Lamp Mfg. Co., 136 W. 52d St., New York, N. Y.

HEADLIGHTS, Tractor Electric

Hall Lamp Co., C. M., Rivard & Hancock Sts., Detroit, Mich. "Solar." (See page 385.)

Indiana Lamp Co., Connersville, Ind. (See pages 546 and 547.)

Solar—See Hall Lamp Co.

HEADS, Boring

Hoefer Mfg. Co., Chicago & Jackson Sts., Freeport, Ill.

Marvin & Casler Co., 118 Roberts St., Canastota, N. Y.

HEADS, Special Cylinder, for Fords

Green Engineering Co., Fourth & St. Clair Sts., Dayton, O.

Laurel Motors Corp., 11th & Meridian Sts., Anderson, Ind. "Roofs."

Roofs—See Laurel Motors Corp.

HEAT DEFLECTORS FOR FORDS—See Deflectors, Heat

HEAT INDICATING METERS—See Meters, Heat Indicating

HEAT TREATING—See Treating, Heat

HEATED CLOTHING—See Clothing, Electrically Heated, Aviators

HEATED STEERING WHEELS — See Wheels, Heated Steering

HEATERS, Automobile

(See also Gloves, Electrically Heated; also Wheels, Heated Steering)

Brackett Auto Heater Co., 4217 Elm St., Milwaukee, Wis.

Brickey Auto Heater Co., Valley City, N. Dak.

Chicago Flexible Shaft Co., 608 La Salle Ave., Chicago, Ill. "Clark."

Clark—See Chicago Flexible Shaft Co.

Cox Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y. "Mason," "Thermo."

Dunco—See Dunkirk Corp.

Dunkirk Corp., 16 E. Second St., Dunkirk, N. Y. "Dunco."

Hill Pump Valve Co. See Zinke Co.

K. P. Mfg. Co., 250 W. 54th St., New York, N. Y.

K & S Auto Heater & Lock Co., 3357 S. Michigan Ave., Chicago, Ill. (See page 663.)

Konsrv Electric Co., 2041 E. Third St., Cleveland, O.

Lehman Bros., 10 Bond St., New York, N. Y. "Queen," "Star."

Letts—See Manifold Heater Co.

Lytle Auto Heater Co., Memphis, Tenn.

Manifold Heater Co., 15 Railroad St., Cortland, N. Y. "Letts."

Mason—See Cox Brass Mfg. Co.

Milwaukee Auto Specialty Co., 705-15 Chestnut St., Milwaukee, Wis. "Radio."

Ottofy Auto Heater Co., 2652 Locust St., St. Louis, Mo.

Perfection—See Standard Parts Co.

Queen—See Lehman Bros.

Radio—See Milwaukee Auto Specialty Co.

Reliable Auto Heater Co., Guardian Bldg., Cleveland, O. "Vesuvian."

Sager Co., J. H., 36-38 S. Water St., Rochester, N. Y.

Standard Parts Co., Cleveland, O. "Perfection." (See pages 408 and 409.)

Star—See Lehman Bros.

Taplex Corp., 47 W. 34th St., New York, N. Y.

Thermo—See Cox Brass Mfg. Co.

Utility—See Zinke Co.

Vesuvian—See Reliable Auto Heater Co.

Zinke Co., 1323-25 Michigan Ave., Chicago, Ill. (Sole Distributors for Hill Pump Valve Co., Chicago, Ill. "Utility.") (See page 551.)

HEATERS, Automobile, for Fords

(Exhaust heaters; for heated steering wheels—See Wheels, Heated Steering)

Apco Mfg. Co., Eddy St., Providence, R. I.

Bailey—See Riverside Machine Works.

Brickey Auto Heater Co., Valley City, N. Dak.

Bridgeford—See Home Light Co.

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Crew-Levick Co., 111 N. Broad St., Philadelphia, Pa. "Victor."

Home Light Co., 3353 Milwaukee Ave., Chicago, Ill. "Bridgeford."

McClintock, Edward, 221 S. Fifth St., Minneapolis, Minn.

Ottofy Auto Heater Co., 3652 Locust St., St. Louis, Mo.

Perfection—See Standard Parts Co.

Riverside Machine Works, 228 Croton Ave., New Castle, Pa. "Bailey."

Standard Parts Co., Cleveland, O. "Perfection." (See pages 408 and 409.)

Victor—See Crew-Levick Co.

HEATERS, Feed Water

National Pipe Bending Co., River & Lloyd Sts., New Haven, Conn.

Ofeldt & Sons, F. W., Nyack, N. Y.

HEATERS, Glue

Advance Machinery Co., Van Wert, O. "Wetmore."

Francis Co., Chas. E., E. Fifth St., Rushville, Ind.

Wetmore—See Advance Machinery Co.

HEATERS, Mixture

(For heating mixture in Carbureter or Manifold to facilitate starting)

Crone, F. G., 334 Genesee St., Buffalo, N. Y.

Davenport Vulcanizer & Mfg. Co., 506 Brady St., Davenport, Ia. "Gillaspy."

Despatch Mfg. Co., 104 N. Second St., Minneapolis, Minn.

Electric Intake Heater Co., 117 E. Cortland St., Jackson, Mich.

Ellis Car-Bur-Aid—See Motor Efficiency Corp.

Frear, R. A., 111 E. Green St., Ithaca, N. Y.

Gillaspy—See Davenport Vulcanizer & Mfg. Co.

Ideal Mfg. Co., 1525 Main St., Anderson, Ind.

Ieco—See Interstate Electric Co.

Indus—See Industrial Electric Mfg. Co.

Industrial Electric Mfg. Co., 139 Beaubien St., Detroit, Mich. "Indus."

International Motor Products Co., 2037 S. Wabash Ave., Chicago, Ill. "Perfection."

Interstate Electric Co., Baronne & Perdido Sts., New Orleans, La. "Ieco."

Lepper Mfg. Co., 101 N. Federal Ave., Mason City, Ia.

Mechanical Utilities Co., 5 N. La Salle St., Chicago, Ill.

Motor Efficiency Corp., Real Estate Trust Bldg., Philadelphia, Pa. "Ellis Car-Bur-Aid."

National Automobile Equipment Co., Industrial Bldg., Indianapolis, Ind.

New York Coil Co., 338-40 Pearl St., New York, N. Y.

Olsen—See United States Vaporizer Co.

Perfection—See International Motor Products Co.

Perkins Appliance Co., 4 Birnie Ave., Springfield, Mass.

Sprague Mfg. Co., E. H., 18th & Izard Sts., Omaha, Neb. "Thorwalds."

Staats & Co., Geo., 74 Bayard St., Brooklyn, N. Y. "Stalit."

Stalit—See Staats & Co.

Suburban Lighting & Gas Engine Co., Summit & Lagrange Sts., Toledo, O.

Thompson Mfg. Co., 811 24th St., Des Moines, Ia.

Thorwalds—See Sprague Mfg. Co.

United States Vaporizer Co., 214 State St., Boston, Mass. "Olsen."

Wonder Carburetor Heater Co., Mason City, Ia.

HEATERS, Mixture, for Fords

(See also Mixers, Fuel; also Primers, Engine; also Manifolds, Special; For Kerosene Carburetors, See Carburetors, Kerosene)

American Mfg. Co., Jefferson, Ia.

Cooper Mfg. Co., F., New Rockford, N. Dak.

Evergood—See Grossman Mfg. Corp.

Gardner Carburetor & Brass Works, 201 Summit Ave., Detroit, Mich.

Grossman Mfg. Corp., Emil, Bush Terminal Bldg. No. 20, Brooklyn, N. Y. "Evergood."

Hill-Smith Metal Goods Co., Dept. H, Boston, Mass. "Letts." (See page 221.)

Hot-o-Spot Starter Co., 615 N. Pearl St., Columbus, O.

Ideal Mfg. Co., 1525 Main St., Anderson, Ind.

Letts—See Hill-Smith Metal Goods Co.

Martens Co., E. A., Ninth & Main Sts., Lafayette, Ind.

Olsen—See United States Vaporizer Co.

Perkins Appliance Co., 4 Birnie Ave., Springfield, Mass.

Redmond—See Riverside Specialty Co.

Riverside Specialty Co., Riverside, Cal. "Redmond."

Star Generator Co., Logansport, Ind.

United States Vaporizer Co., 214 State St., Boston, Mass. "Olsen."

Willard Co., Citizens Nat'l. Bank Bldg., South Bend, Ind.

HEATERS, Radiator

(For keeping radiators from freezing in garage)

Consolidated Car Heating Co., Singer Bldg., New York, N. Y.

Edison Electric Appliance Co., 5660 W. Taylor St., Chicago, Ill.

Konsrv Electric Co., 2041 E. Third St., Cleveland, O.

Metal Specialties Mfg. Co., 338-52 N. Kedzie Ave., Chicago, Ill. "Presto." (See page 333.)

Neverout—See Rose Mfg. Co.

Presto—See Metal Specialties Mfg. Co.

Rose Mfg. Co., 910 Arch St., Philadelphia, Pa "Neverout."

HEATERS, Special Garage

Cosy—See Superior Mfg. Co.

Fuller & Warren Co., River & Monroe Sts., Troy, N. Y. "Stewart."

Honn, Peter, 578 Stocking Ave., Grand Rapids, Mich. (See page 703.)

Lombardi Motor Car Co., 67-71 Minerva St., Derby, Conn. "Sunbeam."

Rippley Mfg. Co., Grafton, Ill.

Safety Heater Co., 378 Main St., East Orange, N. J.

Schleit Mfg. Co., W. A., Eastwood St., Syracuse, N. Y. "Wasco."

Scientific Heater Co., 1095 E. 152d St., Cleveland, O.

Stewart—See Fuller & Warren Co.

Sunbeam—See Lombardi Motor Car Co.

Superior Mfg. Co., Said & Magnolia Sts., Pittsburgh (N. S.), Pa. "Cosy."

Wasco—See Schleit Mfg. Co.

HEEL PLATES—See Plates, Heel, Pedal or Step

HEEL RESTS—See Rests, Heel

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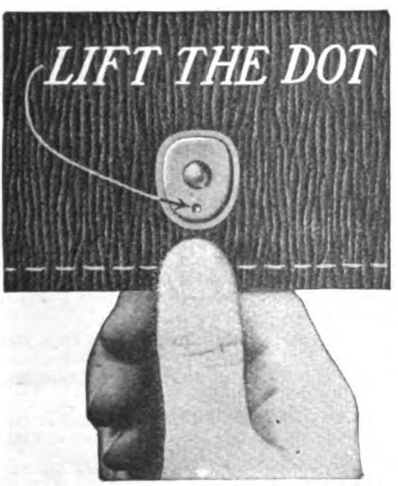

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HELMETS, Aviators

(See also Clothing, Aviators)

Abercrombie & Fitch Co., Madison Ave. & 45th St., New York, N. Y. "King."

International Coat Co., 114-16 Fifth Ave., New York, N. Y.

King—See Abercrombie & Fitch Co.

Sanders Co., 218½ Indiana Ave., Indianapolis, Ind.

Spalding & Bros., A. G., 126 Nassau St., New York, N. Y.

HIGH SPEED STEEL—See Steel, High Speed

HINGE FORMING MACHINES—See Machines, Hood Hinge Forming

HINGES, Cabinet

(For Heel Boards, Boxes and Cabinets)

Keeler Brass Co., 261-71 Godfrey Ave., Grand Rapids, Mich.

Sargent & Co., Water & Wallace Sts., New Haven, Conn.

Stanley Works, New Britain, Conn. (See page 347.)

HINGES, Door

Aetna Brass Mfg. Co., 1633 E. 55th St., Cleveland, O.

American Brass Novelty Co., Grand Haven, Mich.

Douglas & Lomason Co., 642 Lincoln Ave., Detroit, Mich.

Eastern Production Co., 137 Leib St., Detroit, Mich. (See page 345.)

Eberhard Mfg. Co., 2734 Tennyson Rd., Cleveland, O.

English & Mersick Co., New Haven, Conn. (See page 573.)

Eureka—See Parsons Mfg. Co.

Ferro Stamping & Mfg. Co., 287-97 Franklin St., Detroit, Mich.

Gem—See Parsons Mfg. Co.

Geuder, Paeschke & Frey Co., 1422-1700 St. Paul Ave., Milwaukee, Wis. (See page 679.)

Konigslow Mfg. Co., Otto E., 3701 Perkins Ave., Cleveland, O.

McKinney Mfg. Co. (N. S.), Pittsburgh, Pa.

Metal Specialties Mfg. Co., 338-52 N. Kedzie Ave., Chicago, Ill. "Presto." (See page 333.)

Monarch—See Parsons Mfg. Co.

O'Brien Mfg. Co., Joseph F., 391 Broadway, New York, N. Y.

Ochsner & Sons Co., A., 1060 State St., New Haven, Conn.

Parsons Mfg. Co., Detroit, Mich. "Gem," "Monarch," "Eureka."

Presto—See Metal Specialties Mfg. Co.

Smith & Co., Jos. N., E. Grand Blvd. & Dubois St., Detroit, Mich.

Soss Mfg. Co., 435-43 Atlantic Ave., Brooklyn, N. Y.

Stanley Works, New Britain, Conn. (See page 347.)

Wainwright & Son, W. W., 16th St. & Western Ave., Connersville, Ind.

Woodruff & Sons Co., Walter W., Mount Carmel, Conn.

HINGES, GARAGE DOOR—See Hangers and Hinges, Garage Door

HINGES, Hood

A. Z. Co., 530 W. 56th St., New York, N. Y. (See page 563.)

Bronson Co., Homer D., Beacon Falls, Conn.

Eastern Production Co., 137 Leib St., Detroit, Mich. (See page 345.)

Hunt & Dorman Mfg. Co., 1600 E. 24th St., Cleveland, O.

Scovill Mfg. Co., Waterbury, Conn. (See page 659.)

Smith & Co., Jos. N., E. Grand Blvd. & Dubois St., Detroit, Mich.

Waterbury Brass Goods Corp., 160 Washington Ave., Waterbury, Conn.

Woodruff & Sons Co., Walter W., Mount Carmel, Conn.

HINGES, Wind Shield

(For shields on closed cars)

Illinois Brass Mfg. Co., 226-30 W. Ontario St., Chicago, Ill.

HOBBING MACHINES — See Machines, Gear Hobbing

HOISTS, BODY—See Hoists, Truck Body

HOISTS, PORTABLE—See Cranes, Portable

HOISTS, Truck Body

(Power and Hand Hoists for Dumping Bodies.)

Archer Iron Works, 34th Pl. & Western Ave., Chicago, Ill. (See page 865.)

Columbian Street Tank Co., 1601-21 W. 12th St., Kansas City, Mo.

Garage Equipment Co., 3244 Shields Ave., Chicago, Ill. "George."

George—See Garage Equipment Co.

Hebb Motors Co., 1333 P St., Lincoln, Neb. "King."

Horizontal Hydraulic Hoist Co., 35 25th St., Milwaukee, Wis. "Young." (See page 347.)

Hydraulic Hoist Mfg. Co., 292 Walnut St., St. Paul, Minn.

Hydro-Hoist Co., Milwaukee, Wis. (See page 347.)

King—See Hebb Motors Co.

Lally Commercial Body Co., Paris St., Everett, Mass. "Perfection."

Meisel Press Mfg. Co., 945 Dorchester Ave., Boston, Mass. (See page 319.)

Perfection—See Lally Commercial Body Co.

Truck Engineering Co., 7031 Broadway, Cleveland, O.

Wood Hydraulic Hoist & Body Co., 560 Franklin St., Detroit, Mich.

Young—See Horizontal Hydraulic Hoist Co.

HOLDERS, Aircraft Chart

Sperry Gyroscope Co., Brooklyn, N. Y.

HOLDERS, Battery

(See also Boxes, Battery)

Patterson—See Stanley & Patterson.

Stanley & Patterson, 23 Murray St., New York, N. Y. "Patterson."

HOLDERS, BELT, FOR FORDS — See Guides, Fan Belt

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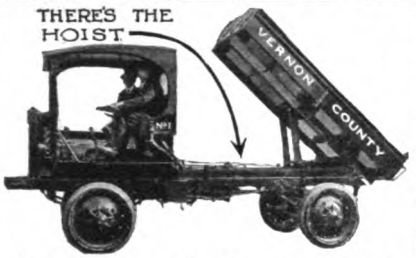
FOR ALL MAKES AND SIZES OF TRUCKS



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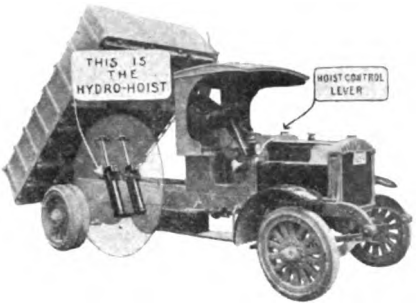

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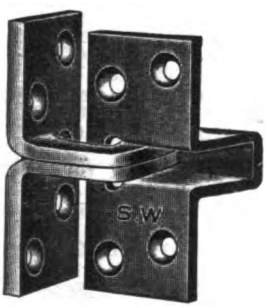

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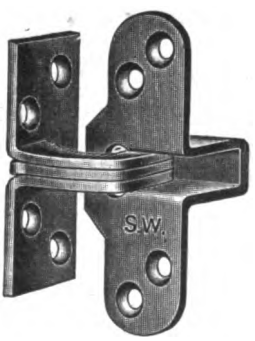

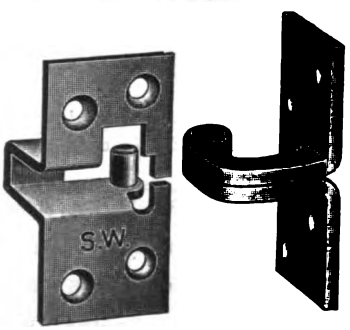

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Art Works Shop, 441-49 Ellicott St., Buffalo, N. Y.
Balzer Co., Gus, New York American Bldg., New York, N. Y.
English & Mersick Co., New Haven, Conn. (See page 573.)
Hawkes & Co., T. G., Corning, N. Y.
International Silver Co., Meriden, Conn.
Liberty Works, Egg Harbor City, N. J.
Watson Co., Mechanics St., Attleboro, Mass.

HOLDERS, BOW—See Holders, Top

HOLDERS, CHART—See Holders, Aircraft Chart

HOLDERS, CRANK—See Holders, Starting Crank

HOLDERS, DOOR—See Holders, Garage Door

HOLDERS, EMBLEM—See Holders, Flag

HOLDERS, Flag, Pennant and Emblem

(See also Flags, Pennants and Emblems)

A. F. H. Co., Dayton, O.
America—See Rouse & Co.
American Automobile Accessories Co., B. & O. R. R. & Blue Rock St., Cincinnati, O. "3 A."
Art Metal Works, 7 Mulberry St., Newark, N. J.
Bloch Metal Stamping Co., 58 Walker St., New York, N. Y.
Bon Tour Mfg. Co., Cobleskill, N. Y. "Griptite."
Climax Shock Absorber Co., Benton Harbor, Mich.
Combination Auto Lock Co., St. Louis, Mo. "Comco."
Comco—See Combination Auto Lock Co.
Continental Auto Parts Co., Knightstown, Ind.
Dow Wire & Iron Works, Franklin, Buchanan & Pocahontas Sts., Louisville, Ky.
Fitzgerald-Noble Co., 437 C. St., Richmond, Cal. "Patria."
Griptite—See Bon Tour Mfg. Co.
Grillo—See Morris & Menkhaus Mfg. Co.
H. K. Metal Products Co., 60 Grand St., New York, N. Y. "Liberty." (See page 349.)
Howe Mfg. Co., Chicago, Ill.
Hudson Products Co., 44 E. 23d St., New York, N. Y.
Jones Co., Ira A., 17 N. Wabash Ave., Chicago, Ill. "Old Glory."
Kallgren, Geo. H., Iron Exchange Bldg., Minneapolis, Minn. "Safety First."
Liberty—See H. K. Metal Products Co.
Liberty Flag Holder Co., W. Broadway & Grand St., New York, N. Y.
Modern Tool & Stamping Co., 311-17 S. Clinton St., Chicago, Ill.
Morris & Menkhaus Mfg. Co., 34 E. Court St., Cincinnati, O. "Grillo."
Neverout—See Rose Mfg. Co.
Old Glory—See Jones Co.
Patria—See Fitzgerald-Noble Co.
Richardson Ball Bearing Skate Co., 154 E. Erie St., Chicago, Ill.
Rose Mfg. Co., 910 Arch St., Philadelphia, Pa. "Neverout."
Rouse & Co., H. B., 2214-16 Ward St., Chicago, Ill. "America."
Safety First—See Kallgren, Geo. H.
Seng Auto Device Co., 1305 Michigan Blvd., Chicago, Ill.
Stenman Wire Specialty Co., Worcester, Mass.
3 A—See American Automobile Accessories Co.
Utilities Sales Association, 607 W. 43d St., New York, N. Y.

HOLDERS, Flag, Pennant and Emblem, for Fords

Apco Mfg. Co., Eddy St., Providence, R. I.
Morris & Menkhaus Mfg. Co., 34 E. Court St., Cincinnati, O. "Wonermor."
Wonermor—See Morris & Menkhaus Mfg. Co.

HOLDERS, Lathe and Planer Tool

Agrippa—See Williams & Co.
American Tool & Machine Co., Boston, Mass.
Armstrong Bros. Tool Co., 304 N. Francisco Ave., Chicago, Ill. (See page 773.)
Bown Machine Co., Battle Creek, Mich.
Carr—See Thompson & Son Co.
Champion—See Western Tool & Mfg. Co.
O. K. Tool Holder Co., Shelton, Conn.
Ready Tool Co., 624 Iranistan Ave., Bridgeport, Conn. "Red-E."
Red-E—See Ready Tool Co.
Thompson & Son Co., Henry G., 492 State St., New Haven, Conn. "Carr."
Union Tool Co., Orange, Mass.
Western Tool & Mfg. Co., Springfield, O "Champion."
Williams & Co., J. H., 38 Richards St., Brooklyn, N. Y. "Agrippa." (See page 433.)

HOLDERS, License

Automobile License Indicator Co., Lewisburg, Tenn. "Perfection," "Standard."
Brooks & Sons, M. S., Chester, Conn.
Central Brass & Fixture Co., Dept. A., Springfield, O. (See page 137.)
Clamert Mfg. Co., East End Trust Bldg., Pittsburgh, Pa. "Lambert."
Cornelius-Browning Auto Co., 817-19 Jefferson Ave., Toledo, O. "Perfect."
Eberhard Mfg. Co., 2734 Tennyson Rd., Cleveland, O.
Edelmann & Co., E., 341-63 E. Ohio St., Chicago, Ill.
Halladay Co., L. P., 501 N. Monroe St., Streator, Ill.
Lambert—See Clamert Mfg. Co.
Lee Co., Wm. O., Port Huron, Mich.
Metal Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.
Neverout—See Rose Mfg. Co.
Perfect—See Cornelius-Browning Auto Co.
Perfection—See Automobile License Indicator Co.
Reed Co., 801-05 High St., Palo Alto, Cal.
Rose Mfg. Co., 910 Arch St., Philadelphia, Pa. "Neverout."
Stafford Auto Lamp & Number Co., 1475 Michigan Ave., Chicago, Ill.
Standard—See Automobile License Indicator Co.
Whitehouse-LeCompte Mfg. Co., 42-54 Elm St., Newark, N. J.

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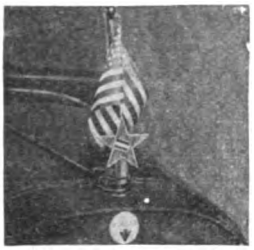

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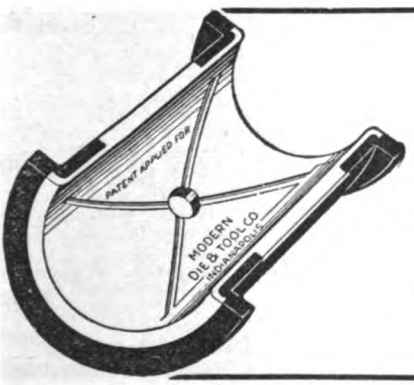

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(Holders or carriers for license plate for front of car)

Apco Mfg. Co., Eddy St., Providence, R. I.

BB—See Bayne Mfg. Co.

Badger Mfg. Corp., Milwaukee, Wis. (See page 139.)

Bayne Mfg. Co., Grant & Davis Sts., Bushnell, Ill. "BB."

Bowen Products Corp., Auburn Division, Auburn, N. Y. (See page 237.)

Eberhard Mfg. Co., 2734 Tennyson Rd., Cleveland, O.

Evergood—See Grossman Mfg. Corp.

Excelsior Auto Parts & Supply Co., 200 Cannon St., Bridgeport, Conn.

Ford-Clark Co., 3125 Perkins Ave., Cleveland, O.

Goodrich-Lenhart Mfg. Co., 429 Widener Bldg., Philadelphia, Pa. (See page 111.)

Grossman Mfg. Corp., Emil, Bush Terminal Bldg. No. 20, Brooklyn, N. Y. "Evergood."

Humboldt Machine & Stamping Co., 31-35 Tenth St., Long Island City, N. Y.

Metal Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

Midway Mechanical Co., 1555 Selby Ave., St. Paul, Minn.

Modern Tool & Stamping Co., 311-17 S. Clinton St., Chicago, Ill.

Morris & Menkhaus Mfg. Co., 34 E. Court St., Cincinnati, O.

Nelson Mfg. Co., A., 2700 Southport Ave., Chicago, Ill.

Neverout—See Rose Mfg. Co.

Oakes Co., Indianapolis, Ind. (See page 279.)

Rose Mfg. Co., 910 Arch St., Philadelphia, Pa. "Neverout."

Ufasco—See Unique Findings & Supply Co.

Unique Findings & Supply Co., Providence, R. I. "Ufasco."

Whitehouse-LeCompte Mfg. Co., 42-54 Elm St., Newark, N. J.

Worthington, A. P., 700 N. Main St., Los Angeles, Cal.

HOLDERS, LUGGAGE—See Holders, Suit Case

HOLDERS, Oil Can

(For carrying oil cans or others on car)

Becco—See Michigan Motor Specialties Co.

Buffum Tool Co., Louisiana, Mo. (See page 707.)

Halladay Co., L. P., 501 N. Monroe St., Streator, Ill. "Reliable."

Mayo-Skinner Mfg. Co., 2115 Elston Ave., Chicago, Ill. "Security." (See page 539.)

Michigan Motor Specialties Co., 26-40 Dubois St., Detroit, Mich. "Becco."

Reliable—See Halladay Co.

Security—See Mayo—Skinner Mfg. Co.

Spiro Mfg. Co., C., 68-72 E. 131st St., New York, N. Y. "Uniq."

Uniq—See Spiro Mfg. Co.

Unique Findings & Supply Co., Providence, R. I.

HOLDERS and OPENERS, Garage Door

(For electric garage door openers—See Openers, Electric)

Allith-Prouty Co., Danville, Ill. "Electromatic." (See page 351.)

Clay, John H., 1318-20 Ridge Ave., Philadelphia, Pa.

Electromatic—See Allith-Prouty Co.

Griffin Mfg. Co., 15th & Cherry Sts., Erie, Pa.

National Mfg. Co., Sterling, Ill.

Perkins Garage Door Control, 187 West Park Ave., Waterloo, Ia. (See page 351.)

Richards-Wilcox Mfg. Co., Third St. & C. B. & I. R. R. Tracks, Aurora, Ill. "Slidetite."

Rixson Co., Oscar C., 501 S. Jefferson St., Chicago, Ill.

Shelby Spring Hinge Co., Shelby, O.

Slidetite—See Richards-Wilcox Mfg. Co.

Stanley Works, New Britain, Conn. (See page 347.)

HOLDERS or TIPPERS, Oil Can

(For holding either round or square oil cans in garage—so arranged that the can may be readily tipped and oil poured from it without lifting it)

Halladay Co., L. P., 501 N. Monroe St., Streator, Ill.

HOLDERS, PENNANT—See Holders, Flag

HOLDERS, PLANER TOOL—See Holders, Lathe and Planer Tool

HOLDERS, SPARE WHEEL, FOR FORDS—See Holders or Carriers, Spare Wheel

HOLDERS, Starting Crank

(Leather strap and holder to prevent starting crank swinging or dropping down)

Atlas Specialty Mfg. Co., 16-22 E. 24th St., Chicago, Ill. (See page 123.)

B. E. Mfg. Co., 18-22 W. 18th St., New York, N. Y. (See page 223.)

Bailey Co., R. B., 1316 S. Grand Ave., Los Angeles, Cal.

Campbell—See Perkins-Campbell Co.

Carter Co., George R., 1600-20 Kentucky Ave., Connersville, Ind.

Chicago Wholesale Saddlery & Mfg. Co., 125-27 N. Halsted St., Chicago, Ill.

Economy Stay Co., Jefferson City, Mo.

Feeser Co., Frank S., 1102 Prospect St., Indianapolis, Ind. "Superior."

G & K—See Graton & Knight Mfg. Co.

Gilbert Mfg. Co., 70-80 Center St., New Haven, Conn.

Graton & Knight Mfg. Co., Worcester, Mass. "G. & K." (See page 99.)

Hager & Son, Chas., 1926 Broadway, New York, N. Y.

Hoover Co., W. H., New Berlin, O.

King Mfg. Co., 305 Washington St., Brookline, Mass.

Nathan Novelty Mfg. Co., 84-90 Reade St., New York, N. Y. (See page 153.)

Niagara Fabric Mfg. Co., 47 Greene St., New York, N. Y.

Perkins-Campbell Co., 634 Broadway, Cincinnati, O. "Campbell." (See page 227.)

Reinhold Belting & Supply Co., 499 Atlantic Ave., Brooklyn, N. Y.

Smith & Son, James, 40-42 Franklin Ave., Brooklyn, N. Y.

Specialty Harness Co., Dayton, Va.

Springfield Harness Co., 55-61 Dwight St., Springfield, Mass.

Stevens & Bro., A. A., 1234 Wabash Ave., Chicago, Ill.

Superior—See Fesser Co.

Williamsport Leather Goods Co., 944 Nichols Pl., Williamsport, Pa. "Wsco."

Wsco—See Williamsport Leather Co.

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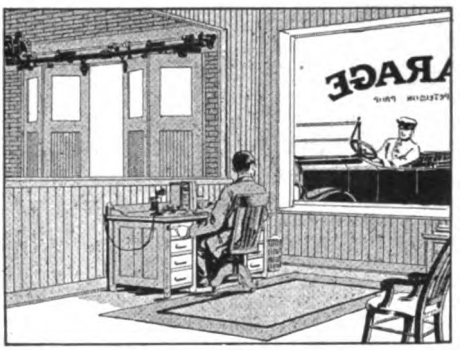
Stay in your office—sit at your desk if you wish—a slight pull on the rope opens the door—the customer drives out or in—another slight pull on the rope and the doors are closed.

The illustration shows the simplicity of the device. Now in daily use in scores of garages. Write us today for full particulars. Price $25 per door.

The Perkins Garage Door Control
187 West Park Ave. Waterloo, Iowa

Opens
GARAGE DOORS
by Electricity



Write us today for full details concerning our "door opening and closing hardware."

Mechanism is controlled by two push buttons placed where desired—pressing the opening button turns on lights, unlocks doors and folds them back clear of the opening.

Pressing the closing button reverses the operation.

If you own a garage you should know all about this device. Write us today.

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Hardware Manufacturers DANVILLE, ILL.

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Oiling Devices—Hub Caps—Automobile Stampings

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107-115 ERIE ST. CAMDEN, N. J.

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HOLDERS, Starting Crank, for Fords

(Metal, leather or fabric holder for keeping starting crank up out of mud and dirt and also to prevent rattling)

B. E. Mfg. Co., 18-22 W. 18th St., New York, N. Y. (See page 223.)

Berry Garage, Gray, Me.

Bowen Products Corp., Auburn Division, Auburn, N. Y. (See page 237.)

G. & K.—See Graton & Knight Mfg. Co.

Graton & Knight Mfg. Co., Worcester, Mass. "G. & K." (See page 99.)

Hoover Co., W. H., New Berlin, O.

King Mfg. Co., 206 Washington St., Brookline, Mass.

Oakes Co., Indianapolis, Ind. (See page 279.)

Perkins-Campbell Co., 634 Broadway, Cincinnati, O. (See page 227.)

Ufasco—See Unique Findings & Supply Co.

Unique Findings & Supply Co., Providence, R. I. "Ufasco."

Wayne Engineering Co., Honesdale, Pa.

Whitehouse-LeCompte Mfg. Co., 42-54 Elm St., Newark, N. J.

HOLDERS, Suit Case or Luggage

(For attaching to running board)

Blake Mfg. Co., South Bend, Ind. (See page 421.)

Boyle Mfg. Co., Santa Fe Ave. & 51st St., Los Angeles, Cal.

Brown Stamping Co., Toledo, O.

Bulldog Luggage Guard Co., Nashua, N. H.

Gemco Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. (See page 135.)

Globe Machine & Stamping Co., 1250 W. 76th St., Cleveland, O.

Grip-Tite Holder Co., Norwich, N. Y.

Hendricks—See Mutual Mfg. Co.

Jay & Dee Specialty Co., 41 Park Row, New York, N. Y.

Moore, Leslie E., 1042 S. Olive St., Los Angeles, Cal.

Mutual Mfg. Co., 50 Cedar Lake Rd., Minneapolis, Minn. "Hendricks."

Strong Bungalow Co., 226 Edgewood St., Hartford, Conn.

HOLDERS, Tire

(For carrying spare tires on cars, including Demountable Rim and Wheel Carriers)

Aetna Brass Mfg. Co., 1633 E. 55th St., Cleveland, O.

Amco—See Chicago Electric Mfg. Co.

Attwood Brass Works, Grand Rapids, Mich. (See page 531.)

Au-To Compressor Co., Wilmington, O. "Oro."

Badger Mfg. Corp., Milwaukee, Wis. (See page 139.)

Buckeye—See Central Brass & Fixture Co.

Central Brass & Fixture Co., Dept. A., Springfield, O. "Buckeye." (See page 137.)

Clayton Co., 136 W. 52d St., New York, N. Y. "Hoover."

Climax—See Strifler & Shannon.

Detloff, A. J., 121 E. Lafayette Ave., Detroit, Mich.

Detroit Tire Carrier & Mfg. Co., Conant Rd. & G. T. R. R., Detroit, Mich.

Douglas & Lomason Co., 642 Lincoln Ave., Detroit, Mich.

Duplex—See International Stamping Co.

E.-C. Sales Co., Postal Telegraph Bldg., Chicago, Ill.

Eberhard Mfg. Co., 2734 Tennyson Rd., Cleveland, O.

Ferris Auto-Carrier Co., 29 S. Seventh St., Philadelphia, Pa. "Quick-Action."

Fox—See Hoover Spring Co.

Gemco Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. (See page 135.)

Gilbert Mfg. Co., 70-80 Center St., New Haven, Conn.

Halladay Co., L. P., 501 N. Monroe St., Streator, Ill.

Hercules—See Western Brass Mfg. Works.

Highton & Sons Co., Wm., Nashua, N. H.

Hoover—See Clayton Co.

Hoover Spring Co., 617-37 Turk St., San Francisco, Cal. "Fox."

Horrocks Iron Works, 234 N. Broad St., Philadelphia, Pa. "Liberty."

International Stamping Co., 400-12 N. Leavitt St., Chicago, Ill. "Victor," "Duplex," "Simplex."

Liberty—See Horrocks Iron Works.

McKinnon Dash Co., 252 Amherst St., Buffalo, N. Y. (See page 663.)

Masco—See Milwaukee Auto Specialty Co.

Milwaukee Auto Specialty Co., 705-15 Chestnut St., Milwaukee, Wis. "Masco."

New Era Spring & Specialty Co., 1138 Hamilton St., N. W., Grand Rapids, Mich. "Sly." (See page 355.)

Oro—See Au-To Compressor Co.

Quick-Action—See Ferris Auto-Carrier Co.

Reese Machine & Tool Works, S., 224-30 W. Main St., Plymouth, Pa.

Simplex—See International Stamping Co.

Sjoholm, N. P., 11 Westmoreland Pl., St. Louis, Mo.

Sly—See New Era Spring & Specialty Co.

Sly Mfg. Co., W. W., Cleveland, O.

Smith & Co., Jos. N., E. Grand Blvd. & Dubois St., Detroit, Mich.

Smith & Gregory, 113 W. 51st. St., New York, N. Y.

Strifler & Shannon, 291-97 Central Ave., Los Angeles, Cal. "Climax."

Sunderland Mfg. Co., 602 W. 22d St., Chicago, Ill. (See page 401.)

Victor—See International Stamping Co.

Western Brass Mfg. Works, Marshall Blvd., 21st St. & C. B. & Q., R. R., Chicago, Ill. "Hercules."

Whitehouse-LeCompte Mfg. Co., 42-54 Elm St., Newark, N. J.

HOLDERS, Tire, for Fords

(For carrying spare tires on cars, including demountable rim and wheel carriers)

Agner Simplex Co.—See Hinrichs Mfg. Co.

American Metal Parts Co.—See Fulton Co.

Apco Mfg. Co., Eddy St., Providence, R. I.

Attwood Brass Works, Grand Rapids, Mich. (See page 531.)

Au-To Compressor Co., Wilmington, O. "Oro."

Auto Forge Sales Co., 80 King Ave., Columbus, O.

Autoguard—See Stewart-Warner Speedometer Corp.

Badger Mfg. Corp., Milwaukee, Wis. (See page 139.)

Central Brass & Fixture Co., Dept. A., Springfield, O. (See page 137.)

Duplex—See International Stamping Co.

Eberhard Mfg. Co., 2734 Tennyson Rd., Cleveland, O.

Elka Mfg. Co.—See Zinke Co.

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Collier's	7	Scientific American	12	Saturday Ev'g Post	27	Saturady Ev'g Post	19
System	7	Saturday Ev'g Post	12	Collier's	15	Scientific American	18
Review of Reviews	6	System	11	Scientific American	14	Collier's	13
World's Work	6	Review of Reviews	8	System	10	Leslie's	8

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HOLDERS, Tire, for Fords (Cont'd)

Ellis-Smith Mfg. Co., 216 Niagara St., Buffalo, N. Y.

Evergood—See Grossman Mfg. Corp.

Ferris Auto-Carrier Co., 29 S. Seventh St., Philadelphia, Pa. "Quick-Action."

Fulton Co., 1910 St. Paul Ave., Milwaukee, Wis. (Sole Distributors for American Metal Parts Co., Milwaukee, Wis.) (See page 139.)

Gemco Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. (See page 135.)

General Appliance Co., 19th St. & Western Ave., Chicago, Ill.

Greene's—See Hastings Mfg. Co.

Grossman Mfg. Corp., Emil, Bush Terminal Bldg. No. 20, Brooklyn, N. Y. "Evergood."

Halladay Co., L. P., 501 N. Monroe St., Streator, Ill.

Hasco—See Howard Auto Specialties Co.

Hastings Mfg. Co., Hastings, Mich. "Greene's."

Hinrichs Mfg. Co., 115 S. Dearborn St., Chicago, Ill. (Sole Distributors for Agner Simplex Co., Burlington, Wis.)

Holmes, George L., 1733 Broadway, New York, N. Y. (Eastern Distributors for Lockfast Holders.) (See page 383.)

Howard Auto Specialties Co., Swampscott, Mass. "Hasco."

Humboldt Machine & Stamping Co., 81-85 Tenth St., Long Island City, N. Y.

International Stamping Co., 400-12 N. Leavitt St., Chicago, Ill. "Duplex," "Simplex."

Kelsey Wheel Co., Detroit, Mich. (See page 355.)

Korect—See New Era Spring & Specialty Co.

Lockfast Mfg. Co., Cleveland, O. (See page 527.)

Lyon—See Metal Stamping Co.

McKinnon Dash Co., 252 Amherst St., Buffalo, N. Y. (See page 663.)

Masco—See Milwaukee Auto Specialty Co.

Metal Stamping Co., 13th St. & Boulevard, Long Island City, N. Y. "Lyon."

Milwaukee Auto Specialty Co., 705-15 Chestnut St., Milwaukee, Wis. "Masco."

Nelson Mfg. Co., A., 2700 Southport Ave., Chicago, Ill.

New Era Spring & Specialty Co., 1138 Hamilton St., N. W., Grand Rapids, Mich. "Sly," "Korect." (See page 355.)

Oro—See Au-To Compressor Co.

Packer Auto Specialty Co., 122 S. Michigan Ave., Chicago, Ill. "Ray."

Protex Mfg. Co., 13-17 N. Jefferson St., Chicago, Ill. (See page 275.)

Quick-Action—See Ferris Auto-Carrier Co.

Ray—See Packer Auto Specialty Co.

Richards-Wilcox Mfg. Co., Third St. & C. B. & Q. R. R. Tracks, Aurora, Ill.

Simplex—See International Stamping Co.

Sly—See New Era Spring & Specialty Co.

Sly Mfg. Co., W. W., Cleveland, O.

Stewart-Warner Speedometer Corp., Chicago, Ill. "Autoguard." (See page 499.)

Ufasco—See Unique Findings & Supply Co.

Unique Findings & Supply Co., Providence, R. I. "Ufasco."

Western Brass Mfg. Works, Marshall Blvd., 21st St. & C. B. & Q. R. R., Chicago, Ill.

Whitehouse-LeCompte Mfg. Co., 42-54 Elm St., Newark, N. J.

Zinke Co., 1323-25 Michigan Ave., Chicago, Ill. (Sole Distributors for Elka Mfg. Co., San Francisco, Cal.)

HOLDERS, TOOL—See Holders, Lathe and Planer Tool

HOLDERS, Top

(For holding or clamping tops securely when in folded or down position; See also Straps, Leather)

Adams—See Rock Island Mfg. Co.

Auto Specialties Mfg. Co., St. Joseph, Mich. "Bair." (See page 193.)

Bair—See Auto Specialties Mfg. Co.

Detroit Tire Carrier & Mfg. Co., Conant Rd. & G. T. R. R., Detroit, Mich.

Moore—See Zinke Co.

Rock Island Mfg. Co., Rock Island, Ill. "Adams." (See page 753.)

Sharrer Patent Top Co., 239 W. 56th St., New York, N. Y. (See page 751.)

Western Brass Mfg. Works, Marshall Blvd., 21st St. & C., B. & Q. R. R., Chicago, Ill.

Zinke Co., 1323-25 Michigan Ave., Chicago, Ill. "Moore." (See pages 543 to 552.)

HOLDERS, TOP FOR FORDS—See Clamps, Top Bow

HOLDERS, Watch

(See also Clocks, Dashboard)

Ajax—See Newark Watch Case Material Co.

Burleigh, Geo. K., Penacook, N. H.

Caldwell, Robinson & Vandemark, 74 Cortlandt St., New York, N. Y. "Readwell."

Cowles & Co., C., New Haven, Conn. (See page 339.)

Economic—See Jay & Dee Specialty Co.

Jay & Dee Specialty Co., 41 Park Row, New York, N. Y. "Economic."

Meiser & Co., G. H., 6823 S. Chicago Ave., Chicago, Ill. "Quick Action."

Newark Watch Case Material Co., 15-19 Ward St., Newark, N. J. "Ajax."

Nojar—See Pennsylvania Rubber Co.

O'Brien Mfg. Co., Joseph F., 391 Broadway, New York, N. Y.

Osborne & Stephenson Mfg. Co., Plainville, Conn.

Pennsylvania Rubber Co., Jeannette, Pa. "Nojar."

Quick Action—See Meiser & Co.

Readwell—See Caldwell, Robinson & Vandemark.

Sterling Mfg. Co., Staunton, Va. "Time Clutch."

Time Clutch—See Sterling Mfg. Co.

Voss Auto Watch Co., 811 24th St., Des Moines Ia.

HOLDERS, Watch, for Fords

(See also Clocks, Steering Wheel)

Neverout—See Rose Mfg. Co.

Noe, Seaman P., Asbury Park, N. J.

Rose Mfg. Co., 910 Arch St., Philadelphia, Pa. "Neverout."

HOLDERS or CARRIERS, Spare Wheel, for Fords

Wire Wheel Corp. of America, 835 11th Ave., New York, N. Y. (See page 761.)

HOOD ANTI-RATTLERS FOR FORDS—See Anti-Rattlers, Hood

HOOD CLAMPS FOR FORDS — See Clamps, Hood

HOOD COVERS—See Covers, Radiator

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NEW ERA Foot Accelerator.

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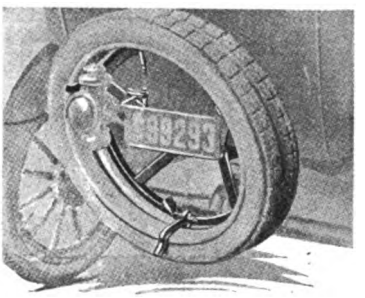
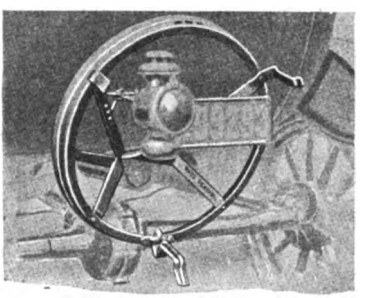
Double Tire Carrier for Fords

Holds one or two tires—heavy lock arrangement—locks one or both rims—made of high-grade cold-rolled steel—Japanned in black.



Guaranteed to be the strongest tire carrier on the market—adaptable to any Ford car—roadster—touring—sedan or coupelet; very easily applied—nothing complicated—regular lamp and license bracket attachable to carrier.



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HOOD FASTENERS FOR FORDS — See Clamps, Hood

HOOD FORMING MACHINES—See Machines, Hood Hinge Forming

HOOD HINGES—See Hinges, Hood

HOOD LACING—See Lacing, Fabric Radiator; also Leather, Rawhide Lace

HOOD SUPPORTS—See Supports, Hood

HOOD VENTILATOR FORMING MACHINES—See Machines, Louvre Forming

HOODS, Motor

A. Z. Co., 530 W. 56th St., New York, N. Y. (See page 563.)

Auto Radiator Mfg. Co., 1712 S. Michigan Ave., Chicago, Ill.

Briskin Mfg. Co., 215 S. Hoyne Ave., Chicago, Ill.

Brummeler's Sons Co., Wm., 413 Ionia Ave., S. W., Grand Rapids, Mich. "Brusco."

Brusco—See Brummeler's Sons Co.

Bush Mfg. Co., Hartford, Conn. (See page 573.)

Chicago Mfg. Co., 1458-64 Michigan Ave., Chicago, Ill. (See page 741.)

Clayton & Lambert Mfg. Co., Detroit, Mich. (See page 743.)

Columbus Auto Brass Co., Columbus, O. (See page 395.)

Cornwall Mfg. Co., E. 128th St. & Penobscot Ave., Cleveland, O.

Detroit Auto Specialty Co., 909-11 Greenwood Ave., Detroit, Mich.

Field Mfg. Co., Owosso, Mich.

Geuder, Paeschke & Frey Co., 1422-1700 St. Paul Ave., Milwaukee, Wis. (See page 679.)

Gier Pressed Steel Co., Lansing, Mich. (See page 505.)

Hayes Mfg. Co., 513 Maybury Grand Ave., Detroit, Mich.

Johnson's Automobile Sheet Metal Works, W. N., 620-28 South J St., Richmond, Ind.

Kells Mfg. Co., W. J., 521-25 W. 45th St., New York, N. Y. (See page 575.)

Lawco—See Lawson Co.

Lawson Co., F. H., Dept. D., Cincinnati, O. "Lawco." (See page 663.)

Long Mfg. Co., Detroit, Mich. (See page 557.)

Maco—See McDole Automobile Sheet Metal Works.

McDole Automobile Sheet Metal Works, 218-20 E. Water St., Kalamazoo, Mich. "Maco." (See page 285.)

Metal Auto Parts Co., Industrial Bldg., Indianapolis, Ind.

Michigan Stamping Co., Mack Ave. & Detroit Terminal, Detroit, Mich.

Mitchell & Son, G. F., 6501 Cedar Ave., Cleveland, O.

Moline Pressed Steel Co., East Moline, Ill.

Motors Metal Mfg. Co., Milford Ave. & P. M. R. R., Detroit, Mich.

Murray Mfg. Co., J. W., Clay & St. Aubin Aves., Detroit, Mich.

Paragon Auto-Parts Mfg. Co., 506 W. 53d St., New York, N. Y.

Perfex Radiator Co., Racine, Wis.

Progressive Sheet Metal Co., 1976-84 Central Ave., Cincinnati, O.

Saginaw Sheet Metal Works, 2060 Genesee St., Saginaw, Mich.

Sargeant Mfg. Co., New & Summit Sts., Newark, N. J.

Sheppard Mfg. Co., 1331 Jackson Blvd., Chicago, Ill.

Shotwell-Hobart-Johnson Co., 712-22 Ontario Ave., N., Minneapolis, Minn.

Todd Mfg. Co., Minneapolis, Minn. (See page 571.)

Wright Cooler & Hood Mfg. Co., 4868-70 N. Clark St., Chicago, Ill.

York Corrugating Co., York, Pa.

HOODS, Motor, for Fords

(Including both standard and stream line hoods)

Bulldog—See Livingston Radiator & Mfg. Co.

Candler Radiator Co., 1034 E. Jefferson Ave., Detroit, Mich.

Corcoran Mfg. Co., 4634 Spring Grove Ave., Cincinnati, O.

Empire Auto Specialty Co., 1622 S. Wabash Ave., Chicago, Ill.

Field Mfg. Co., Owosso, Mich.

Lawco—See Michigan Auto Products Co.

Lawson Co., F. H., Dept. D, Cincinnati, O. (See page 663.)

Livingston Radiator & Mfg. Co., 205 W. 75th St., New York, N. Y. "Bulldog."

Metal Auto Parts Co., Industrial Bldg., Indianapolis, Ind.

Michigan Auto Products Co., Detroit, Mich. "Lawco." (See page 605.)

National Can Co., Detroit, Mich. (See page 553.)

Superior Lamp Mfg. Co., 136 W. 52d St., New York, N. Y.

HOODS, Radiator, for Fords

(Pressed or stamped hoods or covers to apply over radiator to give a V or stream line appearance)

Chicago Mfg. Co., 1458-64 Michigan Ave., Chicago, Ill. (See page 741.)

Corcoran Mfg. Co., 4634 Spring Grove Ave., Cincinnati, O.

Dunham Co., Thos., Aurora, Ill. (See page 75.)

Empire Auto Specialty Co., 1622 S. Wabash Ave., Chicago, Ill.

Field Mfg. Co., Owosso, Mich.

HOODS, Tractor

Kells Mfg. Co., W. J., 521-25 W. 45th St., New York, N. Y. (See page 575.)

Moore Mfg. Co., Waterloo, Ia.

HOOKS, MUD—See Chains or Grips, Non-Skid

HOOKS, Safety Tow

Ideal—See Reinhold Co.

Reinold Co., John J., Marietta, Pa. "Ideal."

HOOKS, Snap

Anchor—See North & Judd Mfg. Co.

Covert Mfg. Co., Troy, N. Y.

Metal Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

North & Judd Mfg. Co., New Britain, Conn. "Anchor." (See page 521.)

Sargent & Co., Walter & Wallace Sts., New Haven, Conn.

Wilcox, Crittenden & Co., 33 Main St., Middletown, Conn.

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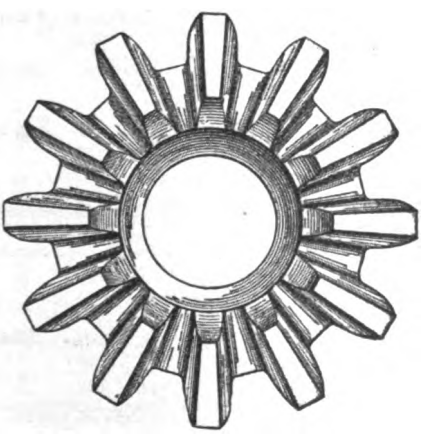

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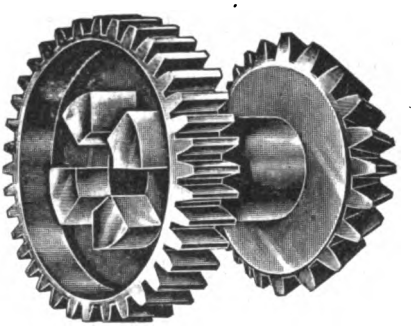

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HOOKS, TIRE CHAIN—See Fasteners, Tire Chain

HOOKS, TOW—See Hooks, Safety Tow

HORIZONTAL BORING MACHINES—See Machines, Horizontal Boring

HORN BULB GUARDS—See Guards, Horn Bulb

HORN BULBS—See Bulbs, Rubber Horn

HORN BUTTONS—See Buttons, Push

HORN BUTTONS FOR FORDS—See Buttons, Special Horn

HORN PEDALS—See Pedals, Horn

HORN REEDS—See Reeds, Horn

HORN SCREENS—See Screens, Horn

HORN SWITCHES—See Switches, Horn

HORN TUBES—See Tubing, Flexible

HORN, VALVE—See Valves, Muffler Cut-out

HORNS, Bulb

Riley-Klotz Mfg. Co., 17 Mulberry St., Newark, N. J.
Standard Metal Mfg. Co., 237 Chestnut St., Newark, N. J.
Warnola Mfg. Co., 73 Wooster St., New York, N. Y.

HORNS, Electric

(Motor driven and vibrator type horns)

Adams-Bagnall Electric Co., 7209 Platt St., Cleveland, O.
American Electric Co., State & 64th Sts., Chicago, Ill. "Samson," "Victor."
Benjamin Electric Mfg. Co., Chicago, Ill. (See page 139.)
C. A. S. Engineering Co., 790 Woodward Ave., Detroit, Mich. (Sole Distributors for United Electrical Mfg. Co., Adrian, Mich. "Trojan."
Cassidy Co., Edward A., 280 Madison Ave., New York, N. Y. (Sales Department for G. Piel Co., Long Island City, N. Y.) (See page 71.)
Clero—See Fitzgerald Mfg. Co.
E. A. Laboratories, Brooklyn, N. Y. "Newtone," "Handphone." (See page 359.)
Economy—See Premier Electric Co.
Fitzgerald Mfg. Co., Torrington, Conn. "Clero." (See page 309.)
Garford Mfg. Co., Elyria, O.
Handphone—See E. A. Laboratories.
Heco—See Heinze Electric Co.
Heinze Electric Co., Lowell, Mass. "Heco."
Holtzer-Cabot Electric Co., Roxbury, Mass. "Reacto."
Inter-State Machine Products Co., 56 Allen St., Rochester, N. Y. "Sterling."
Klaxet—See Klaxon Co.
Klaxonet—See Klaxon Co.
Klaxon Co., Newark, N. J. "Klaxonet," "Klaxet." (See page 359.)
Minerva Mfg. Co., Minerva, O.
Newtone—See E. A. Laboratories.
O'Brien Electrophone Co., Hallowell, Me.
Piel Co.—See Cassidy Co.
Premier Electric Co., 4034 Ravenswood Ave., Chicago, Ill. "Economy."
Reacto—See Holtzer-Cabot Electric Co.
Russell Electric Co., 30 Rowan St., Danbury, Conn. "Saxon."
Samson—See American Electric Co.
Saxon—See Russell Electric Co.
Schwarze Electric Co., Adrian, Mich. (See page 481.)
Sireno Co., 18-20 Rose St., New York, N. Y.
Sparks-Withington Co., Jackson, Mich. "Sparton."
Sparton—See Sparks-Withington Co.
Standard Metal Mfg. Co., 237 Chestnut St., Newark, N. J.
Sterling—See Inter-State Machine Products Co.
Stewart-Warner Speedometer Corp., Chicago, Ill. (See page 499.)
Trojan—See C. A. S. Engineering Co.
Turner Electric Supply Co., 18-20 S. 20th St., Birmingham, Ala.
United Electrical Mfg. Co.—See C. A. S. Engineering Co.
Victor—See American Electric Co.
Warner Electric Co., Walnut & 20th Sts., Muncie, Ind.

HORNS, Electric, for Fords

(Motor driven and vibrator type horns)

Benjamin Electric Mfg. Co., Chicago, Ill. (See page 139.)
Cassidy Co., Edward A., 280 Madison Ave., New York, N. Y. (Sales Department for G. Piel Co., Long Island City, N. Y.) (See page 71.)
Clero—See Fitzgerald Mfg. Co.
Fitzgerald Mfg. Co., Torrington, Conn. "Clero." (See page 309.)
Garford Mfg. Co., Elyria, O.
Heco—See Heinze Electric Co.
Heinze Electric Co., Lowell, Mass. "Heco."
Hi-Lo—See Premier Electric Co.
Klaxet—See Klaxon Co.
Klaxon Co., Newark, N. J. "Klaxonet," "Klaxet." (See page 359.)
Klaxonet—See Klaxon Co.
Piel Co.—See Cassidy Co.
Premier Electric Co., 4034 Ravenswood Ave., Chicago, Ill. "Hi-Lo."
Sparks-Withington Co., Jackson, Mich.
Stewart-Warner Speedometer Corp., Chicago, Ill. (See page 499.)

HORNS, Engine Operated, for Fords

Beartone—See Oakes Co.
Marvel Accessories Mfg. Co., 2011 E. 46th St., Cleveland, O. (See page 763.)
Oakes Co., Indianapolis, Ind. "Beartone." (See page 279.)
Rochester Mfg. Co., 39 Halstead St., Rochester, N. Y.

HORNS, Exhaust

(Tube Horns or Chimes and Whistles)

Aermore—See Fulton Co.
Amco—See Chicago Electric Mfg. Co.
American—See Clark, Alfred H.
Autobird—See Richfield Mfg. Co.
Autochime—See Gray-Hawley Mfg. Co.
Bailey Co., W. J., Newark, N. J.
Barco Mfg. Co., 212-22 W. Illinois St., Chicago, Ill.
Big Four Horn Co., Watseka, Ill.
Buell Mfg. Co., 2988-90 Cottage Grove Ave., Chicago, Ill. (See page 359.)
Chicago Electric Mfg. Co., 523-29 Van Buren St., Chicago, Ill. "Amco."

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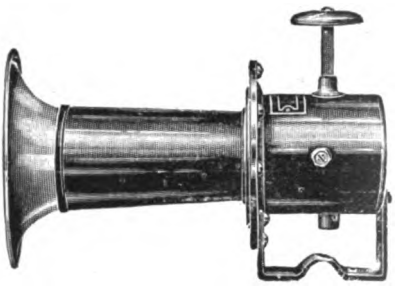

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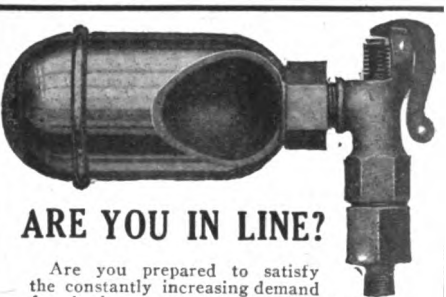

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HORNS, Exhaust (Continued)

Clark, Alfred H., 1307 Howard Ave., Bridgeport, Conn. "American."

Coming Mfg. Co., Railway Exchange Bldg., Chicago, Ill. "Trinity."

Empire—See S. B. R. Specialty Co.

Fulton Co., 1910 St. Paul Ave., Milwaukee, Wis. "Aermore.'" (See page 139.)

Gabriel Mfg. Co., 1407 40th St., N. E., Cleveland, O.

Gray-Hawley Mfg. Co., 937-43 Jefferson Ave., Detroit, Mich. "Autochime."

Husk—See Western Brass Mfg. Works.

Jericho—See Randall-Faichney Co.

Jubilee—See Randall-Faichney Co.

Liberty Accessories Corp., 1138 Chestnut St., St. Louis, Mo. "Stiles Liberty." (See page 663.)

Nightingale—See Riley-Klotz Mfg. Co.

Randall-Faichney Co., 76 Atherton St. (Jamaica Plain), Boston, Mass. "Jericho," "Jubilee."

Richfield Mfg. Co., 1918 Pine St., St. Louis, Mo. "Autobird."

Riley-Klotz Mfg. Co., 17 Mulberry St., Newark, N. J. "Nightingale."

S. B. R. Specialty Co., 17-19 Princeton St., East Orange, N. J. "Empire."

Serum & Co., Chas. H., Chicago & Spaulding Aves., Chicago, Ill.

Stiles Liberty—See Liberty Accessories Corp.

Trinity—See Coming Mfg. Co.

Western Brass Mfg. Works, Marshall Blvd., 21st St. & C. B. & Q. R. R., Chicago, Ill. "Husk."

HORNS, Exhaust, for Fords

(Tube Horns or Chimes and Whistles)

Aermore—See Fulton Co.

Agner Simplex Co.—See Hinrichs Mfg. Co.

Auto Tire Sales Co., 1346-48 Michigan Ave., Chicago, Ill. (See page 773.)

Barco Mfg. Co., 212-22 W. Illinois St., Chicago, Ill.

Buell Mfg. Co., 2988-90 Cottage Grove Ave., Chicago, Ill. (See page 359.)

Crum-Wiley Mfg. Co., Peru, Ind.

Fulton Co., 1910 St. Paul Ave., Milwaukee, Wis. "Aermore." (See page 139.)

Hinrichs Mfg. Co., 115 S. Dearborn St., Chicago, Ill. (Sole Distributors for Agner Simplex Co., Burlington, Wis.)

Jericho—See Randall-Faichney Co.

Jubilee—See Randall-Faichney Co.

Liberty Accessories Corp., 1138 Chestnut St., St. Louis, Mo. "Stiles Liberty." (See page 663.)

McClintock, Edward, 221 S. Fifth St., Minneapolis, Minn.

Minerva Mfg. Co., Minerva, O.

Randall-Faichney Co., 76 Atherton St. (Jamaica Plain), Boston, Mass. "Jericho," "Jubilee."

Stiles Liberty—See Liberty Accessories Corp.

Western Brass Mfg. Works, Marshall Blvd., 21st St. & C. B. & Q. R. R., Chicago, Ill.

HORNS, FAN, FOR FORDS—See Horns, Engine Operated

HORNS, Mechanical

(Hand operated diaphragm horns; for Reed Horns—See Horns, Bulb)

A-Y—See Angsten-Kox Co.

Admonitor—See Warnola Mfg. Co.

American Electric Co., State & 64th Sts., Chicago, Ill. "Samson-Tiger."

Angsten-Kox Co., 5025 S. State St., Chicago, Ill. "A-Y."

Cassidy Co., Edward A., 280 Madison Ave., New York, N. Y. (Sales Department for G. Piel Co., Long Island City, N. Y.) (See page 71.)

Clero—See Fitzgerald Mfg. Co.

Corning Mfg. Co., Railway Exchange Bldg., Chicago, Ill.

E. A. Laboratories, Brooklyn, N. Y. "Newtone," "Handphone." (See page 359.)

Evergood—See Grossman Mfg. Corp.

Fitzgerald Mfg. Co., Railroad Ave., Torrington, Conn. "Clero." (See page 309.)

Garford Mfg. Co., Elyria, O.

Grossman Mfg. Corp., Emil, Bush Terminal Bldg. No. 20, Brooklyn, N. Y. "Evergood."

Handphone—See E. A. Laboratories.

Heco—See Heinze Electric Co.

Heinze Electric Co., Lowell, Mass. "Heco."

Klaxon Co., Newark, N. J. "Klaxonet." (See page 359.)

Klaxonet—See Klaxon Co.

M-L—See Miller-Lovatt Co.

Miller-Lovatt Co., Weatherly, Pa. "M-L."

Newtone—See E. A. Laboratories.

Piel Co.—See Cassidy Co.

Samson-Tiger—See American Electric Co.

Seiss Mfg. Co., 453 Dorr St., Toledo, O.

Sparks-Withington Co., Jackson, Mich. "Sparton-Echo."

Sparton-Echo—See Sparks-Withington Co.

Standard Metal Mfg. Co., 237 Chestnut St., Newark, N. J.

Stewart-Warner Speedometer Corp., Chicago, Ill. (See page 499.)

Warnola Mfg. Co., 73 Wooster St., New York, N. Y. "Admonitor."

HORNS, Mechanical, for Fords

(Hand operated diaphragm horns)

Cassidy Co., Edward A., 280 Madison Ave., New York, N. Y. (Sales Department for G. Piel Co., Long Island City, N. Y.) (See page 71.)

Clero—See Fitzgerald Mfg. Co.

Fitzgerald Mfg. Co., Torrington, Conn. "Clero." (See page 309.)

Klaxon Co., Newark, N. J. "Klaxonet." (See page 359.)

Klaxonet—See Klaxon Co.

Piel Co.—See Cassidy Co.

Sparks-Withington Co., Jackson, Mich.

Standard Auto Horn, Somerville, Mass.

Stewart-Warner Speedometer Corp., Chicago, Ill. (See page 499.)

Warnola Mfg. Co., 73 Wooster St., New York, N. Y.

HORNS, Motorcycle Mechanical

Stewart-Warner Speedometer Corp., Chicago, Ill.

HORNS, Motorcycle Siren

Sireno Co., 18-20 Rose St., New York, N. Y.

HORNS, Siren

(For Ambulances, Police and Fire Department Apparatus)

Inter-State Machine Products Co., 56 Allen St., Rochester, N. Y. "Sterling."

O'Brien Electrophone Co., Hallowell, Me.

Sireno Co., 18-20 Rose St., New York, N. Y.

Sterling—See Inter-State Machine Co.

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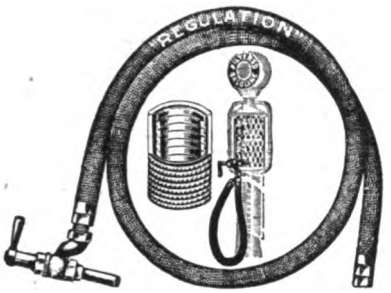

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"OLD CROW"—Valve Stem Packing.

"GENERATOR"—Tubing.

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HORSES, TRESTLES and TRUCKS

Frasse & Co., Peter A., 417 Canal St., New York, N. Y. "Hildreth." (See page 657.)

Hildreth—See Frasse & Co.

Johnstown Automobile Co., Johnstown, Pa.

HOSE BOXES—See Boxes, Hose

HOSE CLAMPS—See Clamps, Hose

HOSE COUPLINGS—See Clamps, Hose

HOSE, FLEXIBLE METAL—See Tubing, Flexible Metal; also Hose, Metal Lined

HOSE, Metal Lined

(For use with gasoline pumps)

American Metal Hose Co., 67 Jewelry St., Waterbury, Conn.

Atlantic Metal Hose Co., 311 W. 59th St., New York, N. Y. (Dealers.) (See page 361.)

Metal Hose & Tubing Co., Raymond & Tillary Sts., Brooklyn, N. Y. "Triplexd." (See page 361.)

Penflex—See Pennsylvania Flexible Metallic Tubing Co.

Pennsylvania Flexible Metallic Tubing Co., Philadelphia, Pa. "Penflex."

Titeflex Metal Hose Corp., Badger Ave. & Runyon St., Newark, N. J. (See page 727.)

Triplexd—See Metal Hose & Tubing Co.

HOSE, RADIATOR—See Hose, Rubber

HOSE, Radiator, for Fords

Asbestos & Rubber Works of America, 1790 Broadway, New York, N. Y. "Motobestos." (See page 425.)

Beaver—See Mechanical Rubber Co.

Cincinnati Rubber Mfg. Co., Cincinnati, O. (See page 361.)

Federal Rubber Co. (Cudahy), Milwaukee, Wis.

Mattson Rubber Co., Lodi, N. J.

Mechanical Rubber Co., 307 W. Randolph St., Chicago, Ill. "Beaver."

Motobestos—See Asbestos & Rubber Works of America.

Thermoid Rubber Co., Trenton, N. J. (See pages 373 and 397.)

Voorhees Rubber Mfg. Co., 18-46 Bostwick Ave., Jersey City, N. J.

HOSE, Rubber

(Radiator hose, including molded radiator connections)

A-B-C—See American Brake-Lining Co.

Acme Rubber Mfg. Co., E. State St., Trenton, N. J.

American Brake-Lining Co., Lansdale, Pa. "A-B-C." (See page 415.)

Barcus—See Electric Hose & Rubber Co.

Boston Belting Co., 84 Linden Park St., Boston, Mass.

Boston Woven Hose & Rubber Co., 110 Portland St., Cambridge, Mass.

Bowers Rubber Works, 68-70 Sacramento St., San Francisco, Cal.

Cincinnati Rubber Mfg. Co., Cincinnati, O. "Norka," "Fidelity," "Losant." (See page 361.)

Cleveland—See Mechanical Rubber Co.

Combination Rubber Mfg. Co., Bloomfield, N. J.

Continental Rubber Works, 1902 Liberty St., Erie, Pa. "Vitalic."

Cyrus—See Electric Hose & Rubber Co.

Dural Rubber Corp., Maple Ave., Flemington, N. J.

Duro—See Electric Hose & Rubber Co.

Electric Hose & Rubber Co., E. Stall St., Wilmington, Del. "Duro," "Laconic," "Cyrus," "Velvet," "Supero," "Barcus."

Empire Rubber & Tire Co., Mulberry St. & Clinton Ave., Trenton, N. J.

Essex Rubber Co., Trenton, N. J.

Federal Rubber Co. (Cudahy), Milwaukee, Wis.

Fidelity—See Cincinnati Rubber Mfg. Co.

Goodrich Co., B. F., S. Main St., Akron, O.

Hamilton Rubber Mfg. Co., Mead & Prince Sts., Trenton, N. J.

Hewitt Rubber Co., 240 Kensington Ave., Buffalo, N. Y.

Hide, Leather & Belting Co., 215 S. Meridian St., Indianapolis, Ind. (See page 389.)

Home Tire Co., Trenton, N. J.

J. E.—See Jackson-Eno Rubber Co.

Jackson-Eno Rubber Co., 1010 S. Main St., Los Angeles, Cal. "J. E."

Laconic—See Electric Hose & Rubber Co.

Losant—See Cincinnati Rubber Mfg. Co.

Manhattan Rubber Mfg. Co., Willett St., Passaic, N. J.

Mechanical Rubber Co., 307 W. Randolph St., Chicago, Ill. "Usco."

Mechanical Rubber Co., C. & P. & Nickel Plate R. R., Cleveland, O. "Cleveland."

Milford Rubber Works, Milford, Ill.

National India Rubber Co., Bristol, R. I.

New Jersey Car Spring & Rubber Co., Wayne & Brunswick Sts., Jersey City, N. J.

New York Belting & Packing Co., 91 Chambers St., New York, N. Y.

Norka—See Cincinnati Rubber Mfg. Co.

Pennsylvania Rubber Co., Jeannette, Pa.

Petley Rubber Mfg. Co., 241 Oregon St., Milwaukee, Wis. (See page 453.)

Quaker City Rubber Co., 629 Market St., Philadelphia, Pa.

Republic Rubber Co., Youngstown, O.

Supero—See Electric Hose & Rubber Co.

Thermoid Rubber Co., Trenton, N. J. (See pages 373 and 397.)

Usco—See Mechanical Rubber Co.

Velvet—See Electric Hose & Rubber Co.

Vitalic—See Continental Rubber Works.

Voorhees Rubber Mfg. Co., 18-46 Bostwick Ave., Jersey City, N. J.

Whitehead Bros. Rubber Co., Trenton, N. J.

Woven Steel Hose & Rubber Co., Trenton, N. J. (See page 415.)

HOUSING PULLERS FOR FORDS—See Pullers, Axle Housing

HOUSINGS, Pressed Steel Axle

(See also Stampings, Steel)

Bossert Corp., Utica, N. Y. (See page 363.)

Crosby Co., Buffalo, N. Y. (See page 669.)

Detroit Pressed Steel Co., Detroit, Mich. (See page 365.)

Gier Pressed Steel Co., Lansing, Mich. (See page 505.)

Hale-Kilburn Corp., 18th St. & Glenwood Ave., Philadelphia, Pa.

Parish Mfg. Co., Reading, Pa. (See page 541.)

Savage Arms Corp., Sharon, Pa. (See page 213.)

Smith Corp., A. O., Milwaukee, Wis. (See page 343.)

Worcester Pressed Steel Co., Worcester, Mass.

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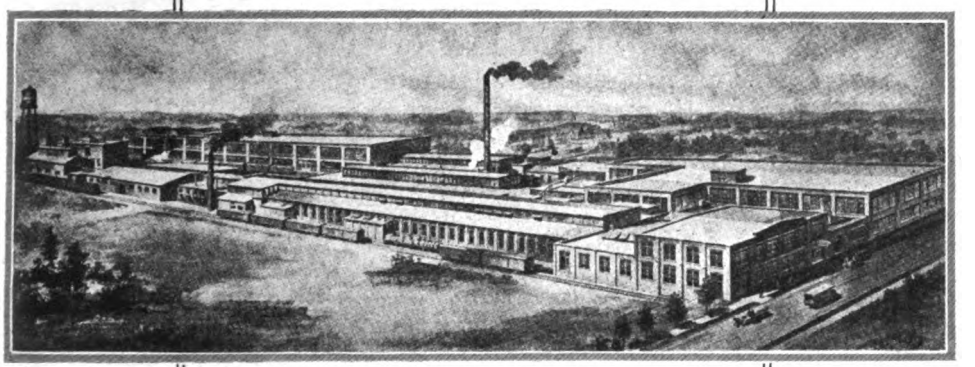
The Plant Behind BOSSERT SHEET METAL STAMPINGS



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HOUSINGS, Special Clutch

La France Truck Co., Ward, Elmira, N. Y.

HUB BOLTS, AIRCRAFT—See Bolts, Aircraft Propeller Hub

HUB BRAKES—See Brakes, Expanding and Contracting

HUB CAP WRENCHES FOR FORDS—See Wrenches, Hub Cap

HUB CAPS—See Caps, Hub

HUB DRUMS—See Winches and Blocks, Car Extracting

HUB FLANGES—See Flanges, Hub

HUB FLANGES, AIRCRAFT PROPELLER —See Hubs, Aircraft Propeller

HUBS, Demountable, for Fords

(For Demountable Wheels—See Wheels, Demountable)

Angiers, 500 N. Vermillion St., Streater, Ill.
Bronxco Wheel Co., 585-87 Jackson Ave., New York, N. Y. (See page 367.)
E-Z-Way—See Gorman Co.
Gorman Co., J. P., 380-84 Canal St., New York, N. Y. "E-Z-Way." (See page 367.)
Hudson Motor Specialties Co., 1932 Arch St., Philadelphia, Pa.
Rapid Change Wheel Co., 211 Ottawa St., N. W., Grand Rapids, Mich.
Simplicity Wheel Co., Grand Rapids, Mich. (See page 763.)

HUBS, Wheel

(For Hub Flanges—See Flanges, Pressed Steel)

American—See Standard Parts Co.
American Pulley Co., 4200 Wissahickon Ave., Philadelphia, Pa.
Bossert Corp., Utica, N. Y. (See page 363.)
Crosby Co., Buffalo, N. Y. (See page 669.)
Gier Pressed Steel Co., Lansing, Mich. (See page 505.)
Kelsey Wheel Co., Detroit, Mich. (See page 355.)
Mott Wheel Works, Jackson, Mich.
Salisbury Wheel & Axle Co., Jamestown, N. Y. (See page opp. Last Page.)
Standard Parts Co., Cleveland, O. "American." (See pages 408 and 409.)
Timken-Detroit Axle Co., Detroit, Mich.
Walker-Weiss Axle Co., Flint, Mich. (See page 789.)
Weston-Mott Co., Flint, Mich.

HUBS and HUB FLANGES, Aircraft Propeller

Empire Axle Co., Dunkirk, N. Y. (See page 83.)
Premier Mfg. Co., Sandy Hook, Conn.

HULLS, Flying Boat

Palmer-Singer Corp., Saranac, N. Y.
Reliance Motor Boat Co., 207th St. & Harlem River, W., New York, N. Y.

HUMIDIFIERS—See Moisteners, Air

HYDRAULIC TESTING DYNAMOMETERS —See Dynamometers, Hydraulic Testing

HYDRO-AEROPLANES—See Section I

HYDROMETERS, Testing

(For testing Battery Electrolyte, Gasoline, etc.)

Beck & Co., Oscar, 280 Maujer St., Brooklyn, N. Y.
Breaknot—See Edelmann & Co.
Dossman Accessory Co., 2905 Marshall Ave., Cincinnati, O.
Edelmann & Co., E., 341-63 E. Ohio St., Chicago, Ill. "Breaknot," "Testometer."
Freezometer—See Taylor Instrument Cos.
Genco—See General Scientific Equipment Co.
General Scientific Equipment Co., Drexel Bldg., Philadelphia, Pa. "Genco."
Griebel Instrument Co., Carbondale, Pa.
Queen-Gray Co., 616-18 Chestnut St., Philadelphia, Pa.
Simplex Hydrometer Co., 314-20 Market St., Newark, N. J.
Storage Battery Supply Co., 239 E. 27th St., New York, N. Y.
Tagliabue Mfg. Co., C. J., Bush Terminal Bldg., Brooklyn, N. Y.
Taylor Instrument Cos., 95 Ames St., Rochester, N. Y. "Freezometer."
Testometer—See Edelmann & Co.
Weinhagen, H., 159-65 Leonard St., New York, N. Y.
Weiss & Son, Albert A., 572 Gates Ave., Brooklyn, N. Y.
Workrite Mfg. Co., 5602 Euclid Ave., Cleveland, O. (See page 519.)

IGNITION CABLE—See Wire, Insulated

IGNITION CUT-OUTS FOR FORDS—See Cut-Outs, Automatic Ignition

IGNITION DYNAMOS—See Magnetos, Ignition

IGNITION SWITCH CONTROLS — See Controls, Ignition Switch

IGNITION SWITCHES—See Switches, Ignition

IGNITION SYSTEMS, SINGLE SPARK—See Systems, Single Spark Ignition

IGNITION TIMERS—See Timers, Ignition

IGNITION WINDINGS — See Windings, Starter and Ignition

IGNITION WIRE—See Wire, Insulated

IGNITION WIRING FOR FORDS—See Sets, Wiring

IMITATION LEATHER — See Leather, Artificial

INCANDESCENT LAMPS — See Lamps, Miniature Incandescent

INCIDENCE INDICATORS, AEROPLANE —See Indicators, Aeroplane Incidence

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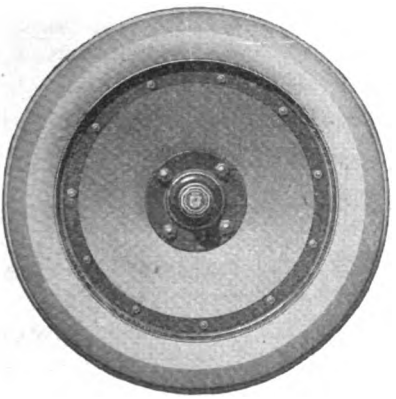
Disteel Wheels



The advantages of Disteel wheels are—tires or wheels can be mounted or demounted with least effort; weight centered at hub, eliminating fly-wheel action of heavy rims; wheels always run true; easier to keep clean; do not "cage" mud and snow; can be repaired at trifling cost in case of bending due to bad skid; absorb heat and keep tires cool; can never become "squeaky" because expansion and contraction of metal is uniform; up to 20 per cent lighter than wood wheels having same load capacity.

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INCLINOMETERS, Aeroplane

Taylor Instrument Cos., 95 Ames St., Rochester, N. Y. "Tycos."

Tycos—See Taylor Instrument Cos.

INDICATING BAROMETERS—See Barometers, Altitude Indicating

INDICATING METERS—See Meters, Heat Indicating; also Meters, Radiator Water Level Indicating; also, Barometers, Altitude Indicating; also Meters, Truck Load Indicating

INDICATING SIGNALS—See Signals, Direction Indicating or Traffic

INDICATORS, Aeroplane Banking

Sperry Gyroscope Co., 126 Nassau St., Brooklyn, N. Y.

INDICATORS, Aeroplane Drift

Sperry Gyroscope Co., 126 Nassau St., Brooklyn, N. Y.

INDICATORS, Aeroplane Incidence

Macy Engineering Co., 12th & Otter Sts., Franklin, Pa.

Sperry Gyroscope Co., 126 Nassau St., Brooklyn, N. Y.

INDICATORS, Aircraft Speed

Foxboro Co., 50 Church St., New York, N. Y.

INDICATORS, AUTOMOBILE SPEED—See Speedometers

INDICATORS, CIRCULATION—See Gages, Water; Also Sight Feeds

INDICATORS, COMPRESSION—See Gages, Cylinder Compression

INDICATORS, DISTANCE OR MILEAGE—See Meters, Distance

INDICATORS, FUEL LEVEL—See Gages, Gasoline Tank

INDICATORS, GRADE—See Meters, Grade

INDICATORS, OIL CIRCULATION—See Sight Feeds, Independent

INDICATORS, SPARK—See Gaps, Spark

INDICATORS, Tail Light

(Device to indicate when tail light goes out)

Stearns Co., E. T., 104 School St. (Belmont Station), Boston, Mass.

INDICATORS, TANK—See Gages, Gasoline Tank

INDICATORS, TIRE PRESSURE — See Gages, Tire Pressure

INDICATORS, WATER CIRCULATION—See Gages, Water Circulating

INFLATORS, TIRE—See Pumps; also Tanks

INITIAL PLATES—See Plates, Robe Monogram or Initial

INJECTORS, Boiler Feeding

American Injector Co., 175 14th Ave., Detroit, Mich.

Penberthy Injector Co., Detroit, Mich.

INJECTORS, GREASE—See Guns, Grease

INJECTORS, WATER—See Moisteners, Air

INNER TIRE SHOES—See Shoes, Inner Tire

INNER TUBE BAGS—See Covers, Spare Tire

INNER TUBE MANDRELS—See Mandrels, Inner Tube

INNER TUBE TESTING TANKS—See Tanks, Inner Tube Testing

INNER TUBES—See Tubes, Inner

INSERTS, CLUTCH—See Cork, Brake and Clutch

INSERTS, SPRING LEAF—See Strips, Spring Leaf

INSPECTION LAMPS—See Lamps, Electric Hand

INSTRUMENTS, Electrical Circuit Testing

(For locating trouble in ignition, lighting or starting circuits)

Ambu—See American Bureau of Engineering.

American Bureau of Engineering, 1018 S. Wabash Ave., Chicago, Ill. "Ambu." (See page 855.)

Boss—See Maroa Mfg. Co.

Edgerton & Co., R. G., Suffolk, Va.

Gastine Sales Co., Summerville, Ga.

Harlan, C. E., Watsonville, Cal.

Maroa Mfg. Co., Maroa, Ill. "Boss."

Phillips Engineering Co., S. Perry St., Dayton, O.

Weston Electrical Instrument Co., 16 Weston Ave., Newark, N. J. (See page 367.)

INSTRUMENTS, FELT TESTING—See Instruments, Rubber and Felt Testing

INSTRUMENTS, Gas Analysis

Coapco—See Combustion Appliances Co.

Combustion Appliances Co., 1775 Lunt Ave., Chicago, Ill. "Coapco."

INSTRUMENTS, Gear Testing

Gleason Works, 1000 University Ave., Rochester, N. Y.

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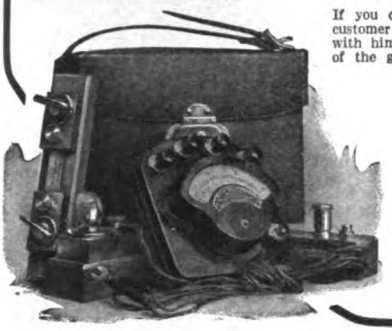


Electrical Repairs Bring the Big Profits

If you cannot repair electrical starting and lighting equipment intelligently, your customer will go elsewhere for this service. He will take the rest of his trade with him. There is more money in electrical repairs than in any other department of the garage business. The demand is enormously increasing.

Weston

Model 280
GARAGE TESTING INSTRUMENT

is the best, the most reliable, and therefore the cheapest electrical equipment for you. It enables you to determine promptly and accurately the condition of the electrical equipment of any automobile, just where the trouble is, and just how to remedy it.

Write for our SPECIAL PROPOSITION. It will interest you.

Weston Electrical Instrument Co., 16 Weston Ave., Newark, N. J.
23 Branch Offices in the Larger Cities

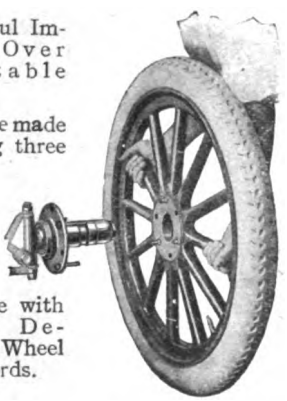
FORD "E-Z-WAY"

Demountable Wheels and Carrier, $15.00

A wonderful Improvement Over Demountable Rims.

Tire change made by removing three nuts.

Extra spare Ford Wheel and Artillery Type Carrier complete with "E-Z-WAY" Demountable Wheel Outfit for Fords.



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380-384 Canal St., New York

Metal Testing Instruments

The Brinell Meter
for determining the hardness of metals and metal products.

The Erichsen Machine
for testing metal sheets and strips.

Write for Catalogues

Herman A. Holz,
7 Madison Ave NY

BRONXCO

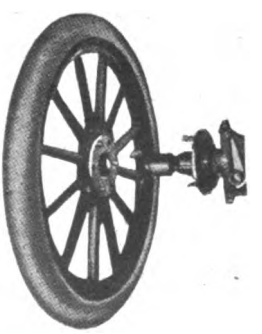
Demountable Wheels and Wheel Carrier for Ford Cars

Dealers: Remember Ford owners are just as anxious to get away from tire trouble and make quick changes while on the road as those with other cars.

Here is your opportunity to sell every owner of a Ford car in your town a set of "Bronxco" Demountable Wheels.

A complete set consists of 4 wheel changes—one extra spare wheel—one wheel carrier—and a socket wrench.

Write us today for our terms to dealers.



BRONXCO WHEEL CO., INC.
585-587 Jackson Ave. - Bronx, N. Y.

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INSTRUMENTS, Metal Testing

(For Metal Testing Machines—See Machines, Metal Testing)

Brinell—See Holz, Herman A.

Holz, Herman A., 7 Madison Ave., New York, N. Y. "Brinell." (See page 367.)

Scleroscope—See Shore Instrument & Mfg. Co.

Shore Instrument & Mfg. Co., 555-57 W. 22d St., New York, N. Y. "Scleroscope."

INSTRUMENTS, Motor Testing

(For locating knocks in motors)

American Electric Co., State & 64th Sts., Chicago, Ill. "Sonoscope."

Hopewell Bros., Watertown, Mass. "Vibracator." (See page 229.)

Pilling & Son Co., G. P., Arch & 23d Sts., Philadelphia, Pa. "Phonendoscope."

Phonendoscope—See Pilling & Son Co.

Sonoscope—See American Electric Co.

Vibracator—See Hopewell Bros.

INSTRUMENTS, Rubber and Felt Testing

Advance Felt Specialty & Cutting Co., 315 S. Jefferson St., Chicago, Ill. (See page 287.)

Shore Instrument & Mfg. Co., 555-57 W. 22d St., New York, N. Y.

INSULATED STAPLES—See Staples, Insulated

INSULATED WIRE—See Wire, Insulated

INSULATING COMPOSITION—See Composition, Insulating

INSULATING TAPE—See Tape, Insulating and Tire

INTAKE MANIFOLDS—See Manifolds, Intake and Exhaust

INTAKE STRAINERS—See Cleaners, Air

INTAKE WASHERS—See Cleaners, Air

INTERNAL BRAKE SHOES FOR FORDS—See Shoes, Brake

INTERNAL GRINDERS—See Grinders, Internal

INTENSIFIERS, SPARK—See Gaps, Spark

IRON CASTINGS—See Castings

IRON CEMENT—See Cement, Cast Iron

IRON LINED BRASS TUBING—See Tubing, Iron Lined

IRON RIVETS—See Rivets, Iron

IRON WASHERS—See Washers, Iron

IRONS, Body or Top

(For Top Holders—See Holders, Top; See also Forgings, Drop)

Ashtabula Bow Socket Co., Ashtabula, O.

Auto Specialties Mfg. Co., St. Joseph, Mich. (See page 193.)

Brewer-Tichener Corp., 115 Port Watson St., Cortland, N. Y.

Cleveland Hardware Co., 4500 Hamilton Ave., Cleveland, O.

Columbus Bolt Works Co., Columbus, O. (See page 187.)

Cowles & Co., C., New Haven, Conn. (See page 339.)

Desoco—See Detroit Socket Co.

Detroit Socket Co., 814 Jefferson Ave., W., Detroit, Mich. "Desoco."

General Drop Forge Co., Buffalo, N. Y. (See page 349.)

Michigan Bolt & Nut Works, ft. Meldrum Ave., Detroit, Mich.

Monarch Carriage Goods Co., 2838-44 Spring Grove Ave., Cincinnati, O.

Motor Products Corporation, Detroit, Mich. (See page 231.)

IRONS, Slat

(For Bow Sockets—See Sockets, Bow)

Amesbury Brass & Foundry Co., Amesbury, Mass.

Scherer & Co., H., 280 Jefferson Ave., E., Detroit, Mich.

Woodruff & Sons Co., Walter W., Mount Carmel, Conn.

IRONS, TIRE—See Tools, Tire

IRONS, TOP—See Irons, Body or Top

JACK SHAFTS—See Countershafts

JACKS, Lifting

(For Wheeled and Two and Four Wheel Lifting Jacks—See Jacks, Special)

A. P. C.—See Ashland Products Co.

Acme—See Spencer's Sons.

Air Device Co., 2975-77 Cottage Grove Ave., Chicago, Ill. "Ten Eyck."

Ajax Auto Parts Co., Sattley Bldg., Racine, Wis.

Alrite—See National Jack & Mfg. Co.

American Chain Co., Bridgeport, Conn. "Weed." (See page 369.)

Ashland Mfg. Co., Second St., Ashland, O. "Eureka," "Atlas," "Speeder."

Ashland Products Co., 50 E. Ninth St., Ashland, O. "A. P. C." (See page 371.)

Atlas—See Ashland Mfg. Co.

Atlas Mfg. Co., Orlando, Fla.

Badger—See Walker Mfg. Co.

Barrett—See Duff Mfg. Co.

Barth Mfg. Co., 348 Milwaukee Ave., Milwaukee, Wis.

Black Jack Co., Funk, O.

Booth—See Halladay Co.

Brisk Blast Mfg. Co., Monroe, Mich.

Buckeye Jack Mfg. Co., Alliance, O.

Cassidy Co., Edward A., 280 Madison Ave., New York, N. Y. (Sales Department for F. W. Mann Co., Milford, Mass.) "Kimball. (See page 71.)

Central Brass & Fixture Co., Dept. A., Springfield, O. "Buckeye." (See page 137.)

Cleveland Mfg. Co., 2734 Tennyson Rd., Cleveland, O.

Coe-Stapley Mfg. Co., 1565 Railroad Ave., Bridgeport, Conn. "Peteler."

Crosby Co., 2120 Vodell St., Pittsburgh, Pa.

De Luxe—See National-Standard Co.

Duff Mfg. Co., Preble Ave., Pittsburgh (N. S.) Pa. "Barrett."

Eberhard Mfg. Co., 2734 Tennyson Rd., Cleveland, O.

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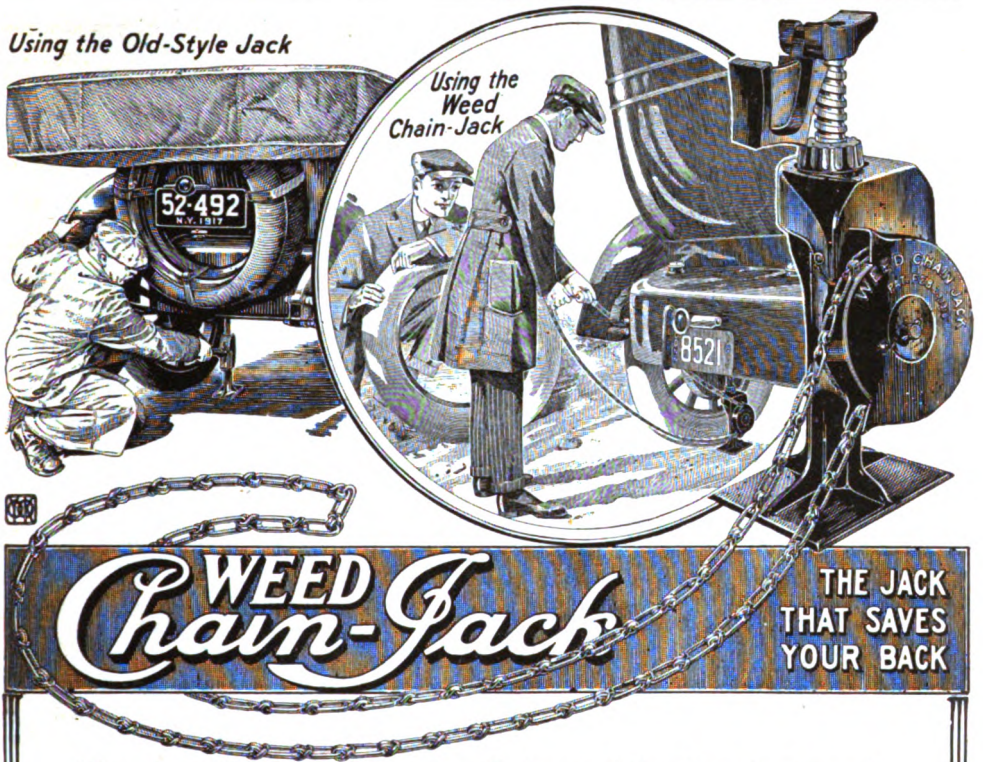

Simply a few pulls on its chain and the heaviest car is raised or lowered without danger and without exertion.

Every motorist has dreaded using the ordinary jack—an unpleasant operation, to say the least, and constantly fraught with danger and much tiresome work. Now all the unpleasant, disagreeable features have been ***entirely eliminated*** by the Weed Chain-Jack. With it, whether raising or lowering the car, you are always ***out of harm's way***—No knocking of head, or soiling of clothes against springs or other projections—***No skinning of knuckles*** or flying up of a "handle"—***No chance of the car coming down,*** often resulting in serious bodily injury—Infinitely easier to operate than any jack on the market.

To operate a Weed Chain-Jack it is not necessary to get down in a cramped, strained position and grovel in mud, grease or dust under a car to work a "handle" that is apt to fly up, with unpleasant results. ***To lift a car*** with the Weed Chain-Jack, simply give a few pulls on its endless chain while you stand erect—clear from springs, tire carriers and other projections. ***To lower a car*** pull the chain in opposite direction. Up or down—there's no labor.

Once in place you never have to touch a Weed Chain-Jack. You do not have to crawl underneath to either raise or lower the car and after the car is lowered, you haul the jack out from under the car by the chain. ***Much superior*** in safety, economy, utility, simplicity and construction.

You will never be satisfied with any other if once you use a

Weed Chain-Jack

Powerful — Safe — Easily Operated

Has a strong cap, providing the kind of support from which an axle will not slip, while a ***broad base*** prevents the jack from upsetting on uneven roads. ***Every Weed Chain-Jack*** is submitted to a lifting test and will support over twice the weight it is ever required to lift. ***Never gets out of order.*** Gears and chain wheels protected by a stamped-steel housing. ***Chain heavily plated*** to prevent rusting. The 8 inch and 10 inch sizes are made with an auxiliary step as illustrated above. When in operative position this step adds two inches to the height of the Jack.

Size	Height When Lowered	Height When Raised	Height When Raised with Auxiliary Stepup
8 inch	8 inches	12½ inches	14½ inches
10 inch	10 inches	15⅜ inches	17⅜ inches
12 inch	12 inches	18½ inches	No. Aux. Step
12 inch Truck	12 inches	19¼ inches	No. Aux. Step

American Chain Company, Inc.

Bridgeport A C @ **Connecticut**

In Canada: Dominion Chain Company, Limited, Niagara Falls, Ontario

Largest Chain Manufacturers in the World

The Complete Chain Line—all types, all sizes, all finishes—from plumbers' safety chain to ships' anchor chain.

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JACKS, Lifting (Continued)

Elite Mfg. Co., Ashland O. "Reliable." (See page 377.)
Eureka—See Ashland Mfg. Co.
General Appliance Co., 19th St. & Western Ave., Chicago, Ill.
Gibraltar Jack Co., 1902 Broadway, New York, N. Y. (See page 371.)
H-C.—See Lane Bros. Co.
Halliday Co., L. P., 501 N. Monroe St., Streator, Ill. "Booth."
Hartford, Edward V., 172 Morgan St., Jersey City, N. J. "Red Rack." (See page 607.)
Hi-Lo Jack Co., 142 Green St., Worcester, Mass.
Holmes, George L., 1733 Broadway, New York, N. Y. (Eastern Distributors for "Peteler" Jacks.) (See page 383.)
Indestructo—See Jiffy Jack Co.
Jiffy Jack Co., 10209 Quincy Ave., Cleveland, O. "Indestructo."
Joyce-Cridland Co., 333 S. Linden Ave., Dayton, O. "XX Century."
Kazoo—See National-Standard Co.
Kimball—See Cassidy Co.
Lane Bros. Co., 48 Prospect St., Poughkeepsie, N. Y. "H-C."
Leader—See National-Standard Co.
Little Giant—See Pratt Mfg. Co.
Manco—See Mann Corp.
Mann Co.—See Cassidy Co.
Mann Corp., Kankakee, Ill. "Manco."
National Jack & Mfg., Co., 130-34 S. Clinton St., Chicago, Ill. "Airite," "Sturdy."
National-Standard Co., Niles, Mich. "Kazoo," "Standard," "Leader," "De Luxe." (See page 371.)
Oliver Mfg. Co., 326 S. Desplaines St., Chicago, Ill. "Peerless."
Peerless—See Oliver Mfg. Co.
Perfect—See Walker Mfg. Co.
Peteler—See Coe-Stapley Mfg. Co.
Pratt Mfg. Co., Wm. E., 35 W. Lake St., Chicago, Ill. "Little Giant," "Pup."
Pup—See Pratt Mfg. Co.
Red Rack—See Hartford, Edward V.
Reliable—See Elite Mfg. Co.
Simplex—See Templeton, Kenly & Co.
Speeder—See Ashland Mfg. Co.
Spencer's Sons, I. S., Guilford, Conn "Acme."
Standard—See National-Standard Co.
Sturdy—See National Jack & Mfg. Co.
Templeton, Kenly & Co., 1020 S. Central Ave (Oak Park), Chicago, Ill. "Simplex."
Ten Eyck—See Air Device Co.
Topping Bros., 122 Chambers St., New York, N. Y.
Triumph—See Walker Mfg. Co.
Victor—See Walker Mfg. Co.
Walker Mfg. Co., Hamilton & Michigan Sts., Racine, Wis. "Badger," "Triumph," "Perfect," "Victor."
Weed—See American Chain Co.
XX Century—See Joyce-Cridland Co.

JACKS, Special

(Wheeled, Two and Four Wheel Lifting, Tire Saving, etc.—See also Jacks, Lifting; also Jacks, Tire Saving)

Adams Jack Co. of America, Citizens National Bank Bldg., Los Angeles, Cal.
Ames Mfg. Co., Franklin, Pa.
Automobile Accessories Co., 824 W. North Ave., Baltimore, Md. "Norwood."
B. & M. Mfg. Co., 624 Michigan St., Chicago, Ill. "Rex."
Bone & Tucker Co., Chicago, Ill. "Tucker."
Brunk Mfg. Co., Marion, Ind.
Cady—See Moore Co.
Clear-O-Scope Co., Angola, Ind.
Ellis-Smith Mfg. Co., 216 Niagara St., Buffalo, N. Y.
Excel—See Randall-Faichney Co.
Horseshoe—See Minnesota Auto Jack Co.
Hovey—See Whetstone & Co.
Mid-West Mfg. Co., Sioux Falls, S. Dak.
Mid-West Mfg. Corp., 1547 University Ave., St. Paul, Minn. "Red Devil Dolly."
Minnesota Auto Jack Co., Providence Bldg., Duluth, Minn. "Horseshoe."
Moore Co., R. L., 12983 Euclid Ave., Cleveland, O.
Norwood—See Automobile Accessories Co.
Randall-Faichney Co., 76 Atherton St., (Jamaica Plain), Boston, Mass. "Excel."
Red Devil Dolly—See Mid-West Mfg. Corp.
Rex—See B. & M. Mfg. Co.
Stucker, J. M. Ottawa, Kans.
Tucker—See Bone & Tucker Co.
Weaver Mfg. Co., 2173 S. Ninth St., Springfield, Ill.
Whetstone & Co., John H., Lapeer, Mich. "Hovey."

JACKS, Special, for Fords

(Wheeled, Two and Four Wheel Lifting, Etc.)

Bone & Tucker Co., Chicago, Ill. "Quick Easy."
Moore Co., R. L., 12983 Euclid Ave., Cleveland, O.
Quick Easy—See Bone & Tucker Co.

JACKS, Tire Saving

(For holding car off the floor when not in use; For Two and Four Wheel Lifting Jacks—See Jacks, Special)

A. P. C.—See Ashland Products Co.
American Automatic Automobile Jack Co., American Bldg., Hicksville, O.
Ashland Mfg. Co., Second St., Ashland, O. "Eureka."
Ashland Products Co., 50 E. Ninth St., Ashland, O. "A. P. C." (See page 371.)
Auto Jack Works, 300-08 E. Michigan St., La Grange, Ind. "Detroit."
Beard Auto Lift Co., Pleasant Lake, Ind.
Brisk Blast Mfg. Co., Monroe, Mich.
Buffington & Co., C. A., Berkshire, N. Y.
Bull Dog—See Toledo Cable Co.
Cannon, W. B., Park St. & Kalamazoo Ave., Vicksburg, Mich.
Central Brass & Fixture Co., Dept. A, Springfield, O. (See page 137.)
Detroit—See Auto Jack Works.
Eberhard Mfg. Co., 2734 Tennyson Rd., Cleveland, O. "Emco."
Ekern Bros. Mfg. Co., Flandreau, S. Dak.
Elite Mfg. Co., Ashland, O. "Reliable." (See page 377.)
Emco—See Eberhard Mfg. Co.
Eureka—See Ashland Mfg. Co.
Hoco—See Hoeft & Co.
Hoeft & Co., Ashland Ave. & Kinzie St., Chicago, Ill. "Hoco."
Jiffy Jack Co., 10209 Quincy Ave., Cleveland, O.
Mazura Mfg. Co., 414 S. Sixth St., St. Louis, Mo.
Moore—See Walker Mfg. Co.
National Jack & Mfg. Co., 130-34 S. Clinton St., Chicago, Ill.

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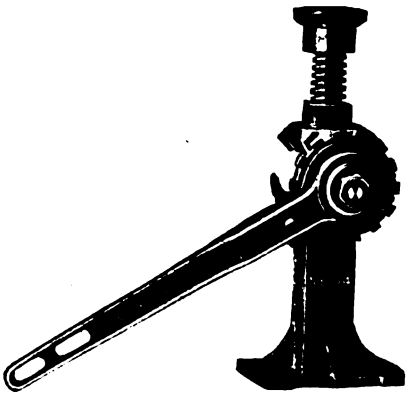


No. 104 APC JACK

will actually lift a 10-ton load.

Handle Controlled Ratchet Jacks

Tire Saving Jacks

"The Quality Line"

The Ashland Products Co.

50 E. Ninth St.

ASHLAND OHIO

The Marvelously Perfected

Gibraltar Auto Jacks

The Only Jack Made You Do Not Need to Get Under Your Car In the Dust and Mud to Place In Position—and It Can Be Operated and Removed While Standing Erect.

Speedier than any other Jack. Absolutely safe and reliable.

Always ready to give you a lift.

Standing erect, a man, woman or child can shove the Jack into the position required under the car, operate it almost as easily as winding up a watch and remove it without soiling the hands or clothing.

Operated by a long, folding, detachable crank handle.

3 Sizes:

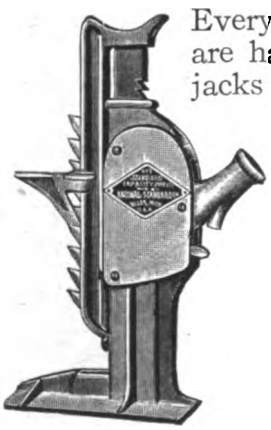
Model A—1-ton cars,	$3.75,	Far West $4.25,	Canada $ 5.
" B—3- " "	7.50,	" " 8.50,	" 10.
" C—10- " "	14.00,	" " 15.50,	" 17.

Write or wire for dealers' terms.

GIBRALTAR JACK CO.

1902 Broadway New York City

Build Up Your Jack Business Upon the Standard Line



Every motorist needs a good jack, and if you are handling motor accessories a good line of jacks is essential to your progress.

Build up your business with the Standard line. It has a jack of every size at every price and for every requirement.

These jacks are attractive in appearance and guaranteed against defects in material and workmanship.

You ought to investigate this opportunity for profits.

National-Standard Company

Niles Michigan

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JACKS, Tire Saving (Continued)

National-Standard Co., Niles, Mich. "Standard." (See page 371.)

Oliver Mfg. Co., 326 S. Desplaines St., Chicago, Ill. "Samson."

Oshkosh Auto Jack Mfg. Co., 170 Marion St., Oshkosh, Wis.

Perfect—See Pratt Mfg. Co.

Pratt Mfg. Co., Wm. E., 35 W. Lake St., Chicago, Ill. "Perfect."

R. T. Sales Co., 3217 North Ave., Milwaukee, Wis. "Zero."

Racine—See Walker Mfg. Co.

Reliable—See Elite Mfg. Co.

S. & S. Automatic Tireaze Co., Marysville, Kans.

St. Louis Malleable Casting Co., 7800 N. Broadway, St. Louis, Mo.

Samson—See Oliver Mfg. Co.

Sedgwick Mfg. Co., Third & Chestnut Sts., Richmond, Ind.

Springville Wood Specialty Co., Springville, N. Y.

Standard—See National-Standard Co.

Star Specialty Mfg. Co., 227-33 W. Erie St., Chicago, Ill.

Toledo Cable Co., 506 S. St. Clair St., Toledo, O. "Bull Dog."

Unique—See United States Mfg. Co.

United States Mfg. Co., Mansfield, O. "Unique."

Walker Mfg. Co., Hamilton & Michigan Sts., Racine, Wis. "Moore," "Racine."

Western Brass Mfg. Works, Marshall Blvd., 21st St. & C. B. & Q. R. R., Chicago, Ill.

Wilbur Lumber Co., Honey Creek, Wis.

Will-Burt Co., Orrville, O.

Zero—See R. T. Sales Co.

JACKS, Tire Saving, for Fords

(For holding car off the floor when not in use)

Ezy-Up—See Star Specialty Mfg. Co.

M. B.—See Metzig Bros.

Metzig Bros., 321 Broadway, Berlin, Wis. "M. B."

St. Louis Malleable Casting Co., 7800 N. Broadway, St. Louis, Mo.

Star Specialty Mfg. Co., 227-33 W. Erie St., Chicago, Ill. "Ezy-Up."

JARS, Rubber Battery

American Hard Rubber Co., 9 Mercer St., New York, N. Y. "Volcan," "Mercury."

Brunswick-Balke-Collender Co., 623-33 S. Wabash Ave., Chicago, Ill. (See page 705.)

Luzerne Rubber Co., Trenton, N. J.

Mercury—See American Hard Rubber Co.

Stokes Rubber Co., Jos., Trenton, N. J.

Volcan—See American Hard Rubber Co.

JIGS, BABBITTING, FOR FORDS—See Jigs, Connecting Rod Babbitting

JIGS, Connecting Rod Babbitting, for Fords

Awlsiz—See Burlington Machine Works.

Burlington Machine Works, 401-03 Front St., Burlington, Ia. "Awlsiz."

Hanten Machine Co., Watertown, S. Dak. (See page 461.)

Honn, Peter, 578 Stocking Ave., Grand Rapids, Mich. (See page 703.)

JIGS, Speedometer Gear Centering

Weber Automobile Supply Co., 6 E. Kiowa St., Colorado Springs, Colo.

JOBBERS AND SUPPLY DEALERS

(Covering only Jobbers and Dealers in Automobile Supplies who advertise in this publication)

Auto Tire Sales Co., 1346-48 Michigan Ave., Chicago, Ill. (See page 773.)

Gray-Heath Co., 1440 S. Michigan Ave., Chicago, Ill. (See Inside Back Cover.)

Motor Electrical Equipment Co., 1251 S. Michigan Ave., Chicago, Ill. (See page 483.)

Motor Parts Co., 843 N. Broad St., Philadelphia, Pa. (See page 459.)

Pruden Hardware Co., W. E., 804-06 Eighth Ave., New York, N. Y. (See page 531.)

Reinhard Bros. Co., 11-13 S. Ninth St., Minneapolis, Minn. (See page 601.)

Western Motor Supply Co., 12th St. & Harmon Pl., Minneapolis, Minn. (See page 461.)

JOINT BOOTS—See Boots, Steering Knuckle

JOINTS, Ball

(For spark and throttle connections)

Amco—See Automotive Mfg. Co.

Automotive Mfg. Co., Dime Bank Bldg., Detroit, Mich. "Amco."

Billings & Spencer Co., Laurel & Park Sts., Hartford, Conn.

Birchwood, C. W., 718 Dellwood Ave., Jacksonville, Fla.

Chicago Screw Co., Homan Ave., & Fillmore St., Chicago, Ill. "Security." (See pages 593 and 601.)

Cincinnati Ball Crank Co., (Oakley), Cincinnati, O. (See page 353.)

Edelmann & Co., E., 341-63 E. Ohio St., Chicago, Ill.

Greer, Frederic, 525 W. Van Buren St., Chicago, Ill.

Mechanical & Electrical Mfg. Co., 2227 Prairie Ave., Chicago, Ill. "Memco."

Memco—See Mechanical & Electrical Mfg. Co.

Peninsular Milled Screw Co., 1090 Lafayette St., E., Detroit, Mich.

Perfection—See Porter & Co.

Porter & Co., W. S., 608 S. Dearborn St., Chicago, Ill. "Perfection."

Security—See Chicago Screw Co.

Smith Mfg. Co., F. H., 3037 Carroll Ave., Chicago, Ill.

JOINTS, Speedometer Swivel

Motors Appliance Co., East Moline, Ill. (See page 781.)

JOINTS, Universal

(For complete drive shaft assemblies—See Shafts, Propeller)

Acme Universal Joint Mfg. Co., 1425 Fulford St., Kalamazoo, Mich. "Oiltite."

Amco—See Automotive Mfg. Co.

Arvac Mfg. Co., Anderson, Ind. (See page 789.)

Automotive Mfg. Co., Dime Bank Bldg., Detroit, Mich. "Amco."

Baker Gun & Forging Co., Batavia, N. Y. (See page 325.)

Bearings Co. of America, Lancaster, Pa. "Sterling." (See page 125.)

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Why these cars give long service

How 47 manufacturers diminish shocks that wear cars out

ONE of the greatest causes of depreciation in motor cars is the constant shocks which the chassis must stand. Every time the car is started a distinct shock is transmitted from the rear wheels to the chassis. These shocks result in excessive wear and are the cause of the breakage of many parts of the chassis.

How this wear may be avoided

The designers and manufacturers of the forty-seven cars listed here have protected the chassis of their cars against most of these shocks by equipping them with Thermoid-Hardy Universal Joints. These universal joints are built up of fabric discs which act as a cushion to absorb shocks. They need no lubrication and regardless of the length of service always remain noiseless.

These joints are constructed by the special Thermoid-Hardy method which gives unusual strength and wearing qualities. More complete information as to the method of construction and the service which these unusual joints give will be willingly sent upon request.

Every Thermoid-Hardy Universal Joint is backed by *Our Guarantee: Thermoid-Hardy Universal Joints will make good or—WE WILL.*

Thermoid Rubber Company

Factory and Main Offices: Trenton, N. J.
Sole American Manufacturers

New York Chicago San Francisco Detroit Los Angeles Philadelphia Pittsburgh Boston London Turin Paris

Thermoid-Hardy Universal Joints
Patented Feb. 22, 1916

Makers of "Thermoid Hydraulic Compressed Brake Lining" and "Thermoid Crolide Compound Casings"

47 Users

Advance-Rumely Co.
Allis Chalmers Manufacturing Co.
American Motor Truck Co.
Biddle Motor Car Co.
Conestoga Motor Truck Co.
Crow - Elkhart Motor Car Co.
Dauch Manufacturing Co.
Doane Motor Truck Co.
Fageol Motor Co.
Forschler Dual Frame Motor Car Co.
H. H. Franklin Manufacturing Co.
Gramm-Bernstein Motor Truck Co.
Haynes Automobile Co.
Hendrickson Motor Truck Co.
Hinkley Motors Co.
International Motor Co.
Karry-Lode Industrial Truck Co.
Kissel Motor Car Co.
Locomobile Co. of America.
Lexington Motor Car Co.
Le Munyon & Biddleman Truck Co.
Lamson Truck & Tractor Co.
Mercer Automobile Co.
Manley Motors Corp.
Moreland Motor Truck Co.
Menominee Motor Truck Co.
N. C. L. Engineering Co.
Nelson & LeMoon.
D. A. Newcomer.
Oneida Motor Truck Co.
Reo Motor Car Co.
Root & Vandervoort Engineering Co.
Rayford Truck & Tractor Co.
Service Motor Truck Co.
Sanford Motor Truck Co.
Stegeman Motor Car Co.
Studebaker Corp.
Stewart Motors Co.
Twin City Four Wheel Drive Auto Co.
Three Point Truck Corporation.
Traffic Motor Truck Co.
Velie Motors Co.
Ward Motor Vehicle Co.
Winther Motor Truck Co.
Walter Motor Truck Co.
Wichita Falls Motor Truck Co.
H. E. Wilcox Motor Co.

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JOINTS, Universal (Continued)

Blood Bros. Machine Co., Allegan, Mich. (See page 377.)

C. A. S. Engineering Co., 790 Woodward Ave., Detroit, Mich. (Sole Distributors for Mechanics Machine Co., Rockford, Ill.) "S. A. F. E." (See page 313.)

Cooper Flexible Transmission Co., Eighth Ave. & 18th St., Brooklyn, N. Y.

Detroit—See Universal Products Co.

Evans—See Merchant & Evans Co.

Hardy—See Thermoid Rubber Co.

Hartford Auto Parts Co., Hartford, Conn. (See page opp. Inside Back Cover.)

Hoosier Auto Parts Co., 718 S. Elliott St., Muncie, Ind.

K-B—See Kinsler-Bennett Co.

Kinsler-Bennett Co., 69 Vernon St., Hartford, Conn. "K-B." (See page 375.)

Konigslow Mfg. Co., Otto E., 3701 Perkins Ave., Cleveland, O.

Mechanics Machine Co.—See C. A. S. Engineering Co.

Merchant & Evans Co., Philadelphia, Pa. "Evans." (See page 377.)

Mutual Machine Co., 25 Wells St., Hartford, Conn. "Warrens."

Norwalk Auto Parts Co., Norwalk, O.

Oiltite—See Acme Universal Joint Mfg. Co.

Peters Machine & Mfg. Co., Madison Ave. & W. 74th St., Cleveland, O.

Rockford Drilling Machine Co., ft. Catherine St., Rockford, Ill.

S. A. F. E.—See C. A. S. Engineering Co.

Schirmer Co., 7319 W. Madison St., Cleveland, O. "Schwitzer."

Schwitzer—See Schirmer Co.

Spicer Mfg. Corp., South Plainfield, N. J. (See page 501.)

Sterling—See Bearings Co. of America.

Thermoid Rubber Co., Trenton, N. J. "Hardy." (See pages 373 and 397.)

Universal Machine Co., Adams St., Bowling Green, O.

Universal Products Co., 116 Woodbridge St., E., Detroit, Mich. "Detroit."

Walker Universal Joint Co., Dime Bank Bldg., Detroit, Mich. (See page 387.)

Warrens—See Mutual Machine Co.

JUTE WEBBING—See Webbing, Jute

KEROSENE ATTACHMENTS—See Carburetors, Kerosene; also Heaters, Mixture; also Manifolds, Special and Jacketed

KEROSENE BURNERS—See Burners, Gasoline and Kerosene

KEROSENE CARBURETORS — See Carburetors, Kerosene; also Heaters, Mixture; also Manifolds, Special and Jacketed

KEROSENE DEVICES—See Carburetors, Kerosene; also Heaters, Mixture; also Manifolds, Special and Jacketed

KEROSENE FURNACES—See Torches, Kerosene

KEROSENE HEATERS—See Heaters, Mixture; also Manifolds, Special and Jacketed

KEROSENE MANIFOLDS FOR FORDS—See Manifolds, Intake

KEROSENE SYSTEMS—See Carburetors, Kerosene; also Heaters, Mixture; also Manifolds, Special and Jacketed

KEROSENE TORCHES — See Torches, Kerosene

KEYS, Acetylene Gas Tank

Buffum Tool Co., Louisiana, Mo. (See page 707.)

Edelmann & Co., E., 341-63 E. Ohio St., Chicago, Ill.

Harris & Reed Mfg. Co., 1510-22 W. 15th St., Chicago, Ill.

Metal Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

Mossberg Co., Frank, Attleboro, Mass. (See page 769.)

Nelson Mfg. Co., A., 2700 Southport Ave., Chicago, Ill.

Ufasco—See Unique Findings & Supply Co.

Unique Findings & Supply Co., Providence, R. I. "Ufasco."

Vaughan Novelty Mfg. Co., 703-11 Fulton St., Chicago, Ill.

Western Brass Mfg. Works, Marshall Blvd., 21st St. & C. B. & Q. R. R., Chicago, Ill.

Whitehouse-LeCompte Mfg. Co., 42-54 Elm St., Newark, N. J.

KEYS, Machine

Moltrup Steel Products Co., Beaver Falls, Pa.

Pennsylvania Shafting Co., Spring City, Pa.

Standard Gauge Steel Co., Beaver Falls, Pa. (See page 341.)

Whitney Mfg. Co., Hartford, Conn. "Woodruff." (See page 177.)

Woodruff—See Whitney Mfg. Co.

KEYS, SPLIT—See Pins, Cotter

KEYS, SWITCH FOR FORDS

Handy-Dandy—See Relax Co.

Relax Co., Norwood, O. "Handy-Dandy."

KEYS, TANK—See Keys, Acetylene Tank

KEYS, VALVE STEM, FOR FORDS—See Pins, Valve Stem

KITS, Aircraft Tool

Cooper Aeroplane Co., John D., Bridgeport, Conn.

KITS, FIRST AID—See Cases, Medical Emergency

KITS, Tire Repair

(See also Cement, Tire; also Patches, Tire; also Plugs, Tire; also Sleeves, Tire)

Goodrich Co., B. F., S. Main St., Akron, O.

Goodyear Tire & Rubber Co., Akron, O. (See page 861.)

Hazen-Brown Co., 430 Court St., Brockton, Mass.

M. & M. Mfg. Co., Lime & Western Aves., Findlay, O.

Michelin Tire Co., Milltown, N. J.

Perma-Loc Mfg. Co., Scranton, Pa. (See page 495.)

Sampson—See Stevens & Co.

Stevens & Co., 375 Broadway, New York, N. Y. "Sampson."

Tingley & Co., Chas. O., 21 St. Georges Ave., Rahway, N. J.

Yatman Rubber Co., 257-69 Mt. Pleasant Ave., Newark, N. J.

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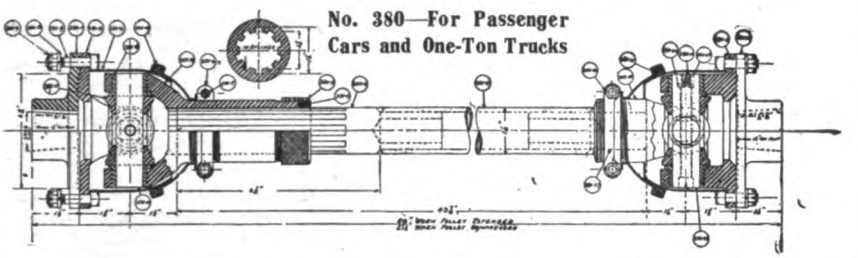
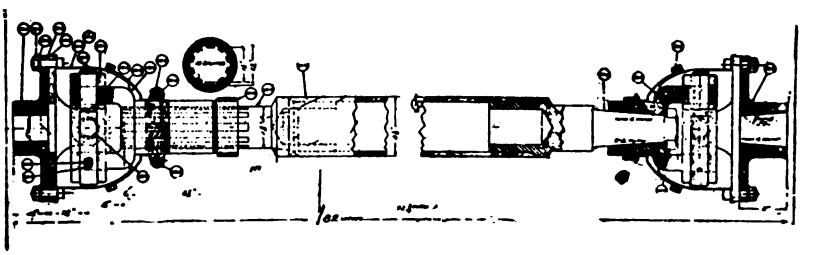
Kinsler-Bennett

Two-Joint Assemblies



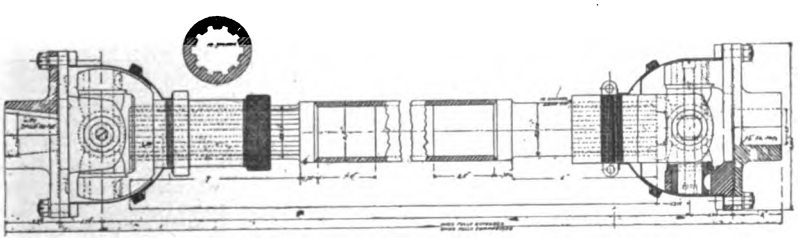
No. 450—For 2 and 3-Ton Trucks

This Propeller Shaft Assembly is designed for 2 and 3-ton trucks. It is made from drop-forgings, heat-treated, and all wearing parts are case-hardened and ground to size.



No. 580—For 5 to 7-Ton Trucks

This Assembly has proved in actual usage, under the greatest stress and strain, everything that can be demanded by the manufacturer who is hauling heavy loads. This new assembly is just as popular in its field as No. 450 is in its.



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The Trade-Mark that stands for Quality and Service.

The Kinsler - Bennett Company

69 Vernon Street Hartford, Conn.

The American Distributing Co., Direct Factory Representatives.
Kresge Bldg., Detroit, Mich.

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KITS, Tool

(For Tool Bags—See Bags, Tool)

Becco—See Michigan Motor Specialties Co.
Chicago Tool & Kit Mfg. Co., 6 E. Lake St., Chicago, Ill. (See page 703.)
Como—See Whitaker Mfg. Co.
Cushman Auto Tool Co., Neil & Green Sts., Champaign, Ill.
Fairmount Tool & Forging Co., 10585 Quincy Ave., Cleveland, O.
Gem—See Whitaker Mfg. Co.
Herbrand Co., Fremont, O.
Michigan Motor Specialties Co., 26-40 Dubois St., Detroit, Mich. "Becco."
Monroe—See Whitaker Mfg. Co.
National—See Whitaker Mfg. Co.
Sterling—See Whitaker Mfg. Co.
Syracuse Wrench Co., Syracuse, N. Y. (See page 773.)
Vichek Tool Co., 10709 Quincy Ave., Cleveland, O.
Whitaker Mfg. Co., 409 S. Green St., Chicago, Ill. "National," "Sterling," "Como," "Monroe," "Gem."

KITS, Tool, for Fords

Chicago Tool & Kit Mfg. Co., 6 E. Lake St., Chicago, Ill. (See page 703.)

KNIVES, TIRE—See Knives, Tire Repair

KNIVES, Tire Repair

Hyde Mfg. Co., Main St., Southbridge, Mass.

KNOCKOUT PUNCHES—See Punches, Center, Prick and Drift

KNUCKLE BOOTS—See Boots, Steering Knuckle

KNUCKLE CASES—See Boots, Steering Knuckle

KNUCKLES, STEERING—See Axles, Front; also Forgings

LACE, FABRIC—See Lacing, Fabric

LACE, LEATHER—See Leather, Rawhide Lace

LACE, WEBBING and CORD, Coach

(See also Trimmings, Cloth and Carpet)

Bridgeport Coach Lace Co., Bridgeport, Conn.
Columbia—See Horstmann Co.
Horstmann Co., Wm. H., Fifth & Cherry Sts., Philadelphia, Pa. "Columbia."
Schlegel Mfg. Co., College Ave. & N. Goodman St., Rochester, N. Y.
Vogt Mfg. & Coach Lace Co., 408-10 St. Paul St., Rochester, N. Y.

LACING, BONNET—See Lacing, Fabric; also Leather, Rawhide Lace

LACING, Fabric Radiator

(For preventing motor hoods or bonnets from rattling)

Bond Co., Charles, 520 Arch St., Philadelphia, Pa. "Fabritex."
Curry Co., J. W., 2615 Cummins St., Cincinnati, O.
Dafoe-Eustice Co., 1164-72 W. Jefferson Ave., Detroit, Mich. "Deco." (See page 227.)
Deco—See Dafoe-Eustice Co.
Fabritex—See Bond Co.
Gilmer Co., L. H., Philadelphia, Pa. (See page 103.)
Hide, Leather & Belting Co., 215 S. Meridian St., Indianapolis, Ind. (See page 389.)
Smith Belting Co., Manning J., 39 E. Ashmead St. (Germantown), Philadelphia, Pa. (See page 101.)
Standard Woven Fabric Co., Walpole, Mass. (See page 787.)
Sutherland Co., F. L., 139 Beaubien St., Detroit, Mich. (See page 523.)

LACING, LEATHER RADIATOR—See Leather, Rawhide Lace

LACQUERS, LAMP—See Enamels, Brass; also Lacquers, Metal

LACQUERS, Metal

American Lacquer Co., Bridgeport, Conn.
Arlington Works, 725 Broadway, New York, N. Y. (See page 169.)
Barrett & Co., M. L., Chicago, Ill.
Egyptian Lacquer Mfg. Co., New York, N. Y.
Hanson & Van Winkle Co., Newark, N. J.
Kalbfleisch Corp., 31 Union Sq., W. New York, N. Y. (See page 87.)
Maas & Waldstein Co., New York, N. Y.
Nikolas & Co., G. J., Chicago, Ill.
Zinsser & Co., W., 195 William St., New York, N. Y.

LAG SCREWS—See Screws, Coach

LAMP ADAPTERS—See Adapters, Electric Lamp

LAMP BRACKETS—See Brackets, Side and Tail Lamp

LAMP BULB BOXES—See Cases, Extra Lamp Bulb

LAMP BULB CASES—See Cases, Extra Lamp Bulb

LAMP BULBS—See Lamps, Miniature Incandescent

LAMP BURNERS—See Burners, Acetylene Lamp

LAMP CONNECTORS—See Connectors, Electric Lamp; also Connectors, Acetylene Lamp; also Tubing, Soft Rubber

LAMP COVERS—See Covers, Lamp

LAMP ENAMELS—See Enamels, Lacquers and Finishes, Brass

LAMP GLASSES—See Glasses, Lamp

LAMP LACQUERS—See Enamels, Brass; also, Lacquers, Metal

LAMP LIGHTERS—See Lighters, Acetylene Lamp

LAMP NUMBERS—See Numbers, Lamp

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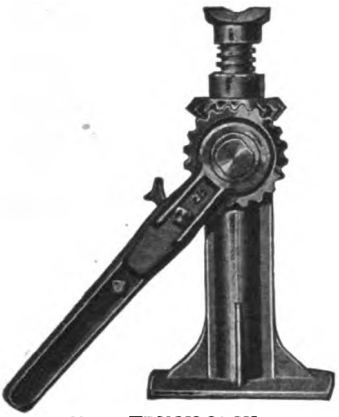
Equip Your Trucks With

"Reliable" Truck Jacks

They Lift and Hold the Heaviest Load in Perfect Safety. Easy to Operate. Quick in Action.



No. 23 TRUCK JACK
(Pat. April 26, 1916)
Wt.: 19½ lbs. Cap.: 6 Tons Adj.: 13 to 20 ins.

Improved Screw Type

For Trucks—Farm Tractors—Threshers, Etc.

Send for our catalog and prices

Elite Mfg. Co. Ashland, Ohio, U. S. A.

Operating hub-deep in a sea of mud at a possible angle of 30 degrees, the front wheels of this famous Four Wheel Drive Truck are being driven by

BLOOD BROTHERS' Universal Joints

A dependable unit under all conditions. For over 14 years the standard for automobiles, trucks, tractors, boats, etc. Six sizes.

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Blood Brothers Machine Co.
Pioneer Makers of Universal Joints
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BLOOD BROS. MACHINE CO.
Pioneer Makers of Universal Joints
ALLEGAN · · · · · · MICHIGAN

"EVANS"
UNIVERSAL JOINTS

PAT. PENDING

consist essentially of two hardened trunnion blocks of large area running in spherical slots which also act as a bushing for the right angle hinge motion.

Compact Durable Powerful

Simply constructed with a minimum number of parts and completely encased within a dust-proof housing which holds grease to lubricate the working parts. Angle of drive up to 15 degrees.

Write Dept. "C-34"

"Hele-Shaw" Clutches "M.&E." Grease Cups

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TRADE MARK M&E CO. REG IN U.S. PAT. OFF

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LAMP REFLECTORS — See Reflectors, Mirror

LAMP SOCKETS—See Sockets, Electric Lamp

LAMP TUBING—See Tubing, Soft Rubber

LAMP WICKS—See Wicks, Lamp

LAMPS or HEAD-LIGHTS, Acetylene

Brown Mfg. Co., John W., Columbus, O. (See page 381.)

Columbia—See Hine-Watt Mfg. Co.

Corcoran-Victor Co., 712 Reading Rd., Cincinnati, O. "Victor."

E & J—See Edmunds & Jones Corp.

Edmunds & Jones Corp., 436 Lawton Ave., Detroit, Mich. "E. & J."

Hall Lamp Co., C. M., Detroit, Mich. "Solar." (See page 385.)

Hawthorne Mfg. Co., 35 Spruce St., Bridgeport, Conn. "Old Sol."

Hine-Watt Mfg. Co., 180 N. Market St., Chicago, Ill. "Columbia."

Indiana Lamp Co., Connersville, Ind. (See pages 546 and 547.)

Neverout—See Rose Mfg. Co.

Old Sol—See Hawthorne Mfg. Co.

Rose Mfg. Co., 910 Arch St., Philadelphia, Pa. "Neverout."

Solar—See Hall Lamp Co.

Superior Lamp Mfg. Co., 136 W. 52d St., New York, N. Y.

Victor—See Corcoran-Victor Co.

Warnola Mfg. Co., 73 Wooster St., New York, N. Y.

LAMPS, DASH—See Lamps, Electric Dash

LAMPS, Electric Dash or Gage

Aid Mfg. Co., 2625-31 Stewart Ave., Chicago, Ill. "Amco."

Amco—See Aid Mfg. Co.

Brock Rubber Co.—See Zinke Co.

Brown Mfg. Co., John W., Columbus, O. (See page 381.)

Chicago Electric Mfg. Co., 2817 S. Halsted St., Chicago, Ill. "Handy."

Connecticut Telephone & Electric Co., Meriden, Conn. (See pages 676 and 677.)

Cowles & Co., C., New Haven, Conn. (See page 339.)

Culver-Stearns Mfg. Co., Detroit, Mich. (See page 381.)

Cuno Engineering Corp., 80 S. Vine St., Meriden, Conn.

Douglas & Rudd Mfg. Co., Bronson, Mich.

Edmunds & Jones Corp., 436 Lawton Ave., Detroit, Mich.

Faw, J. H., 37 Warren St., New York, N. Y. (Eastern and Southern Distributors for Culver-Stearns Lamps.) (See page 387.)

Guide Motor Lamp Mfg. Co., Madison Ave., Cleveland, O.

Handy—See Chicago Electric Mfg. Co.

Holmes, George L., 1733 Broadway, New York, N. Y. (Eastern Distributors for Cuno Lamps.) (See page 383.)

Holt & Beebee Co., 106 Brookline Ave., Boston, Mass.

Howe Mfg. Co., Chicago, Ill.

Liberty Works, Egg Harbor City, N. J.

Metal Specialties Mfg. Co., 338-52 N. Kedzie Ave., Chicago, Ill. "Presto." (See page 333.)

Morse, Frank W., 289 Congress St., Boston, Mass. (See page 453.)

Murphy, H. J., Reading, Mass.

Picard & Co., A. J., 9 W. 61st St., New York, N. Y. (Metropolitan Distributors for Chicago Lamps.) "Handy." (See page 273.)

Presto—See Metal Specialties Mfg. Co.

Rosco—See Rosen & Co.

Rosen & Co., A. W., 610-14 Broadway, New York, N. Y. "Rosco."

S-H—See Stuart-Howland Co.

Smith Mfg. Co., F. A., 185-87 N. Water St., Rochester, N. Y.

Stuart-Howland Co., 131-41 Federal St., Boston, Mass. "S-H."

Vesta Accumulator Co., 2100 Indiana Ave., Chicago, Ill.

Victor—See Corcoran-Victor Co.

Zinke Co., 1323-25 Michigan Ave., Chicago, Ill. (Sole Distributors for A. S. Brock Rubber Co., Boston, Mass.)

LAMPS, ELECTRIC GAGE — See Lamps, Electric Dash

LAMPS, Electric Hand or Inspection

(Lamp and flexible cord for work around car)

Adams-Bagnall Electric Co., 7209 Platt St., Cleveland, O. "Auto-Eyes."

American Enamel Co., Neville St., Providence, R. I. "Britelite."

American Ever Ready Works, Thomson Ave. & Orton St., Long Island City, N. Y. "Everready."

Auto-Eyes—See Adams-Bagnall Electric Co.

Auto Specialty Co., 243 Bloomfield Ave., Passaic, N. J.

Britelite—See American Enamel Co.

Brock Rubber Co.—See Zinke Co.

Cell-Beam Mfg. Co., 1101 Bedford Ave., Brooklyn, N. Y. (See page 457.)

Chicago Electric Mfg. Co., 2817 S. Halsted St., Chicago, Ill. "Handy."

Connecticut Telephone & Electric Co., Meriden, Conn. (See pages 676 and 677.)

Cowles & Co., C., New Haven, Conn. (See page 339.)

Crescent—See McGill Mfg. Co.

Culver-Stearns Mfg. Co., Detroit, Mich. (See page 381.)

Cuno Engineering Corp., 80 S. Vine St., Meriden, Conn.

Dannenhirsch Co., 1905 W. Dauphin St., Philadelphia, Pa. "Danno."

Danno—See Dannenhirsch Co.

Douglas & Rudd Mfg. Co., Bronson, Mich.

Eveready—See American Ever Ready Works

Faw, J. H., 37 Warren St., New York, N. Y. (Eastern and Southern Distributors for Culver-Stearns Lamps.) (See page 387.)

General Electric Co., Schenectady, N. Y. (See pages 564 and 565.)

Guide Motor Lamp Mfg. Co., Madison Ave., Cleveland, O.

Halladay Co., L. P., 501 N. Monroe St., Streator, Ill.

Handy—See Chicago Electric Mfg. Co.

Harvard Electric Co., 525 W. Van Buren St., Chicago, Ill.

Holmes, George L., 1733 Broadway, New York, N. Y. (Eastern Distributer for Cuno Lamps.) (See page 383.)

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Manufacturers, Importers and Exporters of
LINOLEUM CEMENTS, WATERPROOF LIQUID AND MARINE GLUES

152 KNEELAND ST. BOSTON, MASS.

PRODUCTS

20th Century Linoleum Glue-Cement; Jeffery's Marine Glue and Waterproof Liquid Glue

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20TH CENTURY LINOLEUM GLUE-CEMENT, GRADE A, has been registered with the Building Data League, Inc., of N. Y. City. This means:

1. That the League has submitted this material to a thorough investigation including analysis, laboratory tests, investigation of record in service, and inspection of the factory, in order to verify our claims as to its qualities and reliability.

2. That the truth of our claims is certified to by the League's technical committee on Miscellaneous Products appointed by the Board of Governors of the League, a board composed of disinterested architects, engineers, chemists and physicists.

3. That a record of this investigation, how it was made, what tests were made, what companies or individuals were communicated with, is now filed with the League.

4. That a "Findings" on the material including a complete report of the investigation is available to members of the League.

References—Adopted and specified by United States Government and used in numberless Custom Houses and Post Offices through the country, as well as in Institutions, Colleges, etc. Recently supplied to the Universities of Wisconsin, Michigan and Minnesota, also to Wellesley College.

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The purposes for which the various grades of Marine Glue are intended are detailed below.

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Use No. 7—Soft Quality for filling and waterproofing canvas for covering boats and canoes, cabin tops, decks and flying boats.

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For sale by all yacht, boat and canoe supply houses and hardware and sporting goods dealers.

JEFFERY'S WATERPROOF LIQUID GLUE

It is ready for use and needs no heating. Simply open the can and paint it on like ready mixed paint.

All the prominent builders of flying boats use this glue in combination with linen between the veneer of the diagonal planking on all their flying boats, pontoons and floats. It is not only waterproof and elastic, but will waterproof and preserve the linen indefinitely. Experience has shown that when this glue is used, owing to its elasticity, the inside layer of diagonal planking will remain perfectly water-tight, although the outside layer may be badly broken.

This glue will also attach canvas, cork, felt, rubber, leather and linoleum to steel, iron or wood.

Send for booklet "SEAPLANE FLOAT CONSTRUCTION."

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LAMPS, Electric Hand or Inspection (Continued)

Howe Mfg. Co., Chicago, Ill.

McGill Mfg. Co., 259 Indiana Ave., Valparaiso, Ind. "Thumbswitch," "Crescent."

Mabeys Electric & Mfg. Co., 940 N. Pennsylvania St., Indianapolis, Ind.

Metal Specialties Mfg. Co., 338-52 N. Kedzie Ave., Chicago, Ill. "Presto." (See page 333.)

Morse, Frank W., 289 Congress St., Boston, Mass. (See page 453.)

Niagara Searchlight Co., Eighth St. & Ferry Ave., Niagara Falls, N. Y.

Nitelite—See Providence Electric Mfg. Co.

Picard & Co., A. J., 9 W. 61st St., New York, N. Y. (Metropolitan Distributors for Chicago Lamps.) "Handy." (See page 273.)

Premier Electric Co., 4034 Ravenswood Ave., Chicago, Ill. "Stickalite."

Presto—See Metal Specialties Mfg. Co.

Providence Electric Mfg. Co., 23 Broad St., Providence, R. I. "Nitelite."

Rosco—See Rosen & Co.

Rosen & Co., A. W., 610-14 Broadway, New York, N. Y. "Rosco."

S.-H.—See Stuart-Howland Co.

Smith Mfg. Co., F. A., 185-87 N. Water St., Rochester, N. Y.

Stickalite—See Premier Electric Co.

Stuart-Howland Co., 131-41 Federal St., Boston, Mass. "S-H."

Thumbswitch—See McGill Mfg. Co.

Vesta Accumulator Co., 2100 Indiana Ave., Chicago, Ill.

Zinke Co., 1323-25 Michigan Ave., Chicago Ill. (Sole Distributors for A. S. Brock Rubber Co., Boston, Mass.)

LAMPS, ELECTRIC HEAD—See Headlights, Electric

LAMPS, Electric Head, for Fords

B & L Auto Lamp Co., 103-05 Mott St., New York, N. Y. (See page 487.)

Corcoran-Victor Co., 712 Reading Rd., Cincinnati, O. "Victor."

Culver-Stearns Mfg. Co., Detroit, Mich. (See page 381.)

Edmunds & Jones Corp., 436 Lawton Ave., Detroit, Mich.

Faw, J. H., 37 Warren St., New York, N. Y. (Eastern and Southern Distributors for Culver-Stearns Lamps.) (See page 387.)

Gray & Davis, Boston, Mass. (See page 651.)

Guide Motor Lamp Mfg. Co., Madison Ave., Cleveland, O.

Indiana Lamp Co., Connersville, Ind. (See pages 546 and 547.)

K-D Lamp Co., Cincinnati, O. (See page 381.)

Vesta Accumulator Co., 2100 Indiana Ave., Chicago, Ill.

Victor—See Corcoran-Victor Co.

LAMPS, ELECTRIC INSPECTION — See Lamps, Electric Hand

LAMPS, Electric Side and Tail

Adams-Bagnall Electric Co., 7209 Platt St., Cleveland, O. "Auto-Eyes."

American Auto Lamp Co., 20 Desbrosses St., New York, N. Y.

Auto-Eyes—See Adams-Bagnall Electric Co.

Auto Fender Safety Lamp Co., Corinth, N. Y.

B & L Auto Lamp Co., 103-05 Mott St., New York, N. Y. (See page 487.)

Boesch Lamp Co., 1135 Mission St., San Francisco, Cal.

Brown Mfg. Co., John W., Columbus, O. (See page 381.)

Corcoran-Victor Co., 712 Reading Rd., Cincinnati, O. "Victor."

Cowles & Co., C., New Haven, Conn. (See page 339.)

Edmunds & Jones Corp., 436 Lawton Ave., Detroit, Mich.

Electric Auto-Lite Corp., Toledo, O. (See pages 647 to 650.)

English & Mersick Co., New Haven, Conn. (See page 573.)

Gem Stamped Steel Co. (Chelsea Station), Boston, Mass. (Tail lamps only.)

Gray & Davis, Boston, Mass. (See page 651.)

Guide Motor Lamp Mfg. Co., Madison Ave., Cleveland, O.

Hall Lamp Co., C. M., Detroit, Mich. "Solar." (See page 385.)

Hammer Co., E. A., 1839 Euclid Ave., Cleveland, O.

Hawthorne Mfg. Co., 35 Spruce St., Bridgeport, Conn. "Old Sol."

Holt & Beebee Co., 106 Brookline Ave., Boston, Mass.

Howe Mfg. Co., Chicago, Ill.

Indiana Lamp Co., Connersville, Ind. (See pages 546 and 547.)

K-D Lamp Co., Cincinnati, O. (See page 381.)

Kilborn-Sauer Co., Fairfield, Conn.

King-Bull Mfg. Co., 123 E. Ontario St., Chicago, Ill. (Tail Lamp & Rear Searchlight only.) (See page 491.)

Malco—See Malton Specialty Co.

Malton Specialty Co., 755 Boylston St., Boston, Mass. (Tail lamps only). "Malco."

National Supply Corp., Milwaukee, Wis. "Parkinlite." (See page 691.)

Neverout—See Rose Mfg. Co.

Old Sol—See Hawthorne Mfg. Co.

Parkinlite—See National Supply Corp.

Pathfinder—See Columbus Auto Brass Co.

Rosco—See Rosen & Co.

Rose Mfg. Co., 910 Arch St., Philadelphia, Pa. "Neverout."

Rosen & Co., A. W., 610-14 Broadway, New York, N. Y. "Rosco."

S & M Lamp Co., 118 W. 36th Pl., Los Angeles, Cal.

Silvey Electric Co., 10-16 S. Canal St., Dayton, O.

Solar—See Hall Lamp Co.

Stafford Auto Lamp & Number Co., 1475 Michigan Ave., Chicago, Ill. (Tail lamps only.)

Superior Lamp Mfg. Co., 136 W. 52d St., New York, N. Y.

Vesta Accumulator Co., 2100 Indiana Ave., Chicago, Ill.

Victor—See Corcoran-Victor Co.

Warnola Mfg. Co., 73 Wooster St., New York, N. Y.

White Mfg. Co., 155 Cannon St., Bridgeport, Conn.

LAMPS, Electric Side and Tail, for Fords

B & L Auto Lamp Co., 103-05 Mott St., New York, N. Y. (See page 487.)

Corcoran-Victor Co., 712 Reading Rd., Cincinnati, O. "Victor."

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of the Highest Quality

AT MODERATE COST

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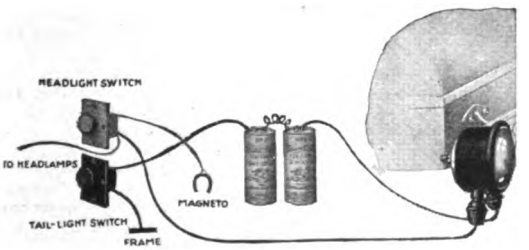

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"A Tail Lamp having two bulbs, one a high voltage for use off of the magneto, the other a low voltage for use on dry cells. A special switch for operating dry cell bulbs furnished with each outfit together with the necessary wire."

Price, each $2.50
Diameter of front.....3¼"
Diameter of ruby lens.....3"

MODEL NO. 6

Especially designed for all model Ford cars manufactured since 1915, with special one bracket support.

Equipped with the K-D positive lock door, "You can't lose 'em." Bulb is 18 c.p., 9 volt, double wire system.

Price, per pair.....$6.00
Diameter of door.....9"

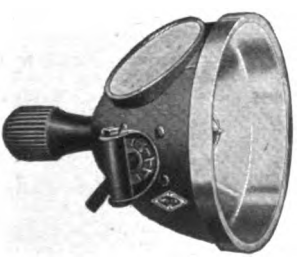
MODEL NO. 31

Suitable for all model Ford cars manufactured since 1915, having special bolt and nut fastener.

Bulb is 2 c.p., 6-8 volt, double wire system unless otherwise ordered.

Price, each $1,00
Diameter of front.....3¼"
Diameter of ruby lens.....3"

THE K-D LAMP COMPANY
CINCINNATI - - OHIO



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The Lamp with the Adjustable Mirror

The Culver-Stearns quality in this lamp is evident. Mechanically and electrically correct, with a reflector that would do justice to a Marine Searchlight and an appearance that is everything that could be desired. It appeals strongly to every car owner.

A comparative test of the power of this lamp with other lamps of this type will quickly demonstrate the superiority of the Giant Searchlight.

Manufactured by
CULVER-STEARNS MANUFACTURING CO.
Worcester, Mass. Detroit, Mich.

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LAMPS, Electric Side and Tail, for Fords (Continued)

Culver-Stearns Mfg. Co., Detroit, Mich. (See page 381.)

Dim Auto Lite Switch Co., Monroe, Mich.

Edmunds & Jones Corp., 436 Lawton Ave., Detroit, Mich.

Faw, J. H., 37 Warren St., New York, N. Y. (Eastern and Southern Distributors for Culver-Stearns Lamps.) (See page 387.)

Guide Motor Lamp Mfg. Co., Madison Ave., Cleveland, O.

Howe Mfg. Co., Chicago, Ill.

Indiana Lamp Co., Connersville, Ind. (See pages 546 and 547.)

K-D Lamp Co., Cincinnati, O. (See page 381.)

Kilborn-Sauer Co., Fairfield, Conn.

Malco—See Malton Specialty Co.

Malton Specialty Co., 755 Boylston St., Boston, Mass. "Malco."

Neverout—See Rose Mfg. Co.

Rose Mfg. Co., 910 Arch St., Philadelphia, Pa. "Neverout."

Smith Mfg. Co., F. A., 185-87 N. Water St., Rochester, N. Y. (Tail lamps only.)

Superior Lamp Mfg. Co., 136 W. 52d St., New York, N. Y.

Victor—See Corcoran-Victor Co.

LAMPS, Electric Speedometer, for Fords

Benjamin Electric Mfg. Co., Chicago, Ill. "Speedolite." (See page 139.)

Bull Pup—See Metal Specialties Mfg. Co.

Bull Terrier—See Metal Specialties Mfg. Co.

Gasco Mfg. Co., 117 E. King St., Lancaster, Pa.

Metal Specialties Mfg. Co., 338-52 N. Kedzie Ave., Chicago, Ill. "Bull Pup," "Bull Terrier." (See page 333.)

Speedolite—See Benjamin Electric Mfg. Co.

LAMPS, ELECTRIC TAIL—See Lamps, Electric Side and Tail

LAMPS, GAGE—See Lamps, Electric Dash or Gage

LAMPS, HAND—See Lamps, Electric Hand

LAMPS, INSPECTION—See Lamps, Electric, Hand or Inspection

LAMPS or BULBS, Miniature Incandescent

Advance Lamp Works, 351-61 W. Superior St., Chicago, Ill.

Alpha Lamp Co., 113 Grant Ave., Harrison, N. J.

Banner Electric Division of National Lamp Works, Youngstown, O.

Brilliant Electric Division of National Lamp Works, 4503 Hough Ave., Cleveland, O.

Buckeye Electric Division of National Lamp Works, Illuminating Bldg., Cleveland, O.

Bryan-Marsh Division of National Lamp Works, 431 S. Dearborn St., Chicago, Ill.

Colonial Electric Division of National Lamp Works, Warren, O.

Columbia Lamp Division of National Lamp Works, 706 Chestnut St., St. Louis, Mo.

Davis Tungsten Lamp Co., 16 Park Ave., Guttenberg, N. J.

Domestic Tungsten Lamp Co., 418 Tenth St., West New York, N. J.

Edison Lamp Works of General Electric Co., Harrison, N. J.

Faw, J. H., 37 Warren St., New York, N. Y. (Eastern and Southern Distributors for "Tungsol" Lamps.) (See page 387.)

Federal Miniature Lamp Division, National Lamp Works of General Electric Co., 926 S. Michigan Ave., Chicago, Ill. (See page 383.)

Federal Miniature Lamp Division, National Lamp Works of General Electric Co., 6 E. 39th St., New York, N. Y. (See page 383.)

Fostoria Lamp Division of National Lamp Works, Fostoria, O.

General Electric Co., Schenectady, N. Y. (See pages 564 and 565.)

General Lamp Division of National Lamp Works, Cleveland, O.

Jaeger Co., H. J., Shippin St. & Park Ave., Weehawken, N. J.

McCandless & Co., H. W., 406 W. 31st St., New York, N.Y.

Mannweiler Co., A. C., 1016 Savilla Ave., Fort Wayne, Ind.

Miniature Incandescent Lamp Corp., 95 Eighth Ave., Newark, N. J. "Tungsol."

Nitros—See Jaeger Co.

Nitros—See Vosburgh Miniature Lamp Co.

Packard Lamp Division of National Lamp Works, Warren, O.

Shelby Lamp Division of National Lamp Works, Shelby, O.

Sterling Electric Lamp Division of National Lamp Works, Warren, O.

Sunbeam Lamp Division of National Lamp Works, 500 S. Clinton St., Chicago, Ill.

Tungsol—See Faw, J. H.

Universal Electrical Lamp Co., 843 Broad St., Newark, N. J.

U. S. Incandescent Lamp Co., Laclede Bldg., St. Louis, Mo.

Vac-U-Ray—See Vosburgh Miniature Lamp Co.

Vosburgh Miniature Lamp Co., 289 Valley Rd., West Orange, N. J. "Nitros," "Vac-U-Ray."

Weehawken Tungsten Lamp Co., 340 Hudson Ave., West Hoboken, N. J.

LAMPS, Motorcycle Acetylene

Hall Lamp Co., C. M., Detroit, Mich. "Solar." (See page 385.)

Hawthorne Mfg. Co., 35 Spruce St., Bridgeport, Conn.

Solar—See Hall Lamp Co.

Superior Lamp Mfg. Co., 136 W. 52d St., New York, N. Y.

LAMPS, Motorcycle Electric

Hall Lamp Co., C. M., Detroit, Mich. "Solar." (See page 385.)

Hawthorne Mfg. Co., 35 Spruce St., Bridge port, Conn.

Indiana Lamp Co., Connersville, Ind. (See pages 546 and 547.)

Solar—See Hall Lamp Co.

Superior Lamp Mfg. Co., 136 W. 52d St., New York, N. Y.

LAMPS, Motorcycle Oil

Indiana Lamp Co., Connersville, Ind. (See pages 546 and 547.)

Neverout—See Rose Mfg. Co.

Rose Mfg. Co., 910 Arch St., Philadelphia, Pa "Neverout."

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fill every automobile lighting requirement—head, side, rear, meter, interior lamps, etc.

They include the new MAZDA C head and spotlight lamp (gas-filled) as well as the proper lamps for Ford cars. They can be had in complete dealer assortment stocks containing lamps for practically any make of American machines. The Auto Lamp Kit guards six Federal MAZDA lamps from breakage and insures the automobile driver against emergencies arising from lamp burnouts.

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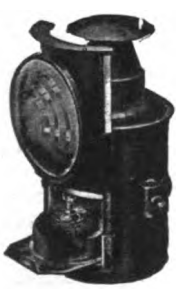

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LAMPS, Oil, Side and Tail

Adams & Westlake Co., Chicago, Ill. "Adlake." (See page 383.)
Adlake—See Adams & Westlake Co.
All-in-One—See Warnola Mfg. Co.
B & L Auto Lamp Co., 103-05 Mott St., New York, N. Y. (See page 487.)
Boesch Lamp Co., 1135 Mission St., San Francisco, Cal.
Brown Mfg. Co., John W., Columbus, O. (See page 381.)
Champion—See Dietz Co.
Corcoran-Victor Co., 712 Reading Rd., Cincinnati, O. "Victor."
Dainty—See Dietz Co.
Derby—See Dietz Co.
Dietz Co., R. E., 60 Laight St., New York, N. Y. "Dainty," "Royal," "Champion," "Royal Junior," "Derby," "Tourist," "Iron-Clad," "Monitor," "Pilot."
E & J—See Edmunds & Jones Corp.
Edmunds & Jones Corp., 436 Lawton Ave., Detroit, Mich. "E. & J."
Gray & Davis, Boston, Mass. (See page 651.)
Hall Lamp Co., C. M., Detroit, Mich. "Solar." (See page 385.)
Indiana Lamp Co., Connersville, Ind. (See pages 546 and 547.)
Iron-Clad—See Dietz Co.
Monitor—See Dietz Co.
Neverout—See Rose Mfg. Co.
Pilot—See Dietz Co.
Rose Mfg. Co., 910 Arch St., Philadelphia, Pa. "Neverout."
Royal—See Dietz Co.
Royal Junior—See Dietz Co.
Solar—See Hall Lamp Co.
Superior Lamp Mfg. Co., 136 W. 52d St., New York, N. Y.
Tourist—See Dietz Co.
Victor—See Corcoran-Victor Co.
Warnola Mfg. Co., 73 Wooster St., New York, N. Y. "All-in-One."

LAMPS, SIDE—See Lamps, Electric Side and Tail; also Lamps, Oil

LAMPS, SWIVEL—See Lights, Spot

LAMPS, TAIL—See Lamps, Electric Side; also Lamps, Oil, Side and Tail

LAMPS, TUNGSTEN—See Lamps, Miniature Incandescent

LAMPS OR HEADLIGHTS, ELECTRIC—See Headlights, Electric

LANDING GEARS, AEROPLANE — See Gears, Aeroplane Landing

LANTERNS, HAND—See Lights, Electric Flash

LAP ROBES—See Robes

LATCHES, EMERGENCY BRAKE, FOR FORDS—See Handles, Emergency Brake

LATCHES, Low Speed Pedal, for Fords

(For holding low speed pedal in engaged position when desired to prevent irregular running and relieve the driver of the strain of holding the pedal with the foot)

Redmond—See Riverside Specialty Co.
Riverside Specialty Co., Riverside, Cal. "Redmond."

LATHE CHUCKS—See Chucks, Lathe

LATHE DOGS—See Dogs, Lathe

LATHE MILLING ATTACHMENTS—See Attachments, Lathe Milling

LATHE TOOL HOLDERS—See Holders, Lathe and Planer Tool

LATHE TOOLS—See Tools, Lathe

LATHES, Aeroplane Strut

Fay & Egan Co., J. A., 415 W. Front St., Cincinnati, O.

LATHES, Aircraft Propeller Turning

Defiance Machine Works, 434 Perry St., Defiance, O.

LATHES, Bench or Precision

Ames & Co., B. C., Waltham, Mass.
Elgin Tool Works, 61-69 N. State St., Elgin, Ill.
Goodell-Pratt Co., Greenfield, Mass. (See page 751.)
Hardinge Bros., 1770 Berteau Ave., Chicago, Ill.
Otis Machine Works, 191 Mill St., Rochester, N. Y.
Pratt & Whitney Co., 111 Broadway, New York, N. Y. (See page 73.)
Remington Tool & Machine Co., 88 Broad St., Boston, Mass.
Rivett Lathe & Grinder Co., 1 Brooks St. (Brighton), Boston, Mass.
Sloan & Chace Mfg. Co., Sixth Ave. & 13th St., Newark, N. J.
South Bend Lathe Works, 600 E. Madison St., South Bend, Ind. (See page 385.)
Stark Tool Co., Waltham, Mass. (See page 385.)
Van Norman Machine Tool Co., Wilbraham Ave., Springfield, Mass.
Waltham Machine Works, Newton & Cutter Sts., Waltham, Mass.

LATHES, Crank Pin

American Tool Works Co., Sixth & Eggleston Sts., Cincinnati, O.
Lodge & Shipley Machine Tool Co., 3055 Colerain Ave., Cincinnati, O.
Tindell-Morris Co., Eddystone, Pa.

LATHES, Engine

American Tool Works Co., Sixth & Eggleston Sts., Cincinnati, O.
Barker & Co., Wm., Pleasant & Wheeler Sts., Covington, Ky.
Barnes Co., W. F. & John, 301 S. Water St., Rockford, Ill.
Barnes Drill Co., 814-30 Chestnut St., Rockford, Ill.
Boye & Emmes Machine Tool Co., 2245-51 Spring Grove Ave., Cincinnati, O.
Bradford Machine Tool Co., 657 Evans St., Cincinnati, O.
Carroll-Jamieson Machine Tool Co., Batavia, O.
Champion Tool Works Co., 2421 Spring Grove Ave., Cincinnati, O.
Chard Lathe Co., Newcastle, Ind.

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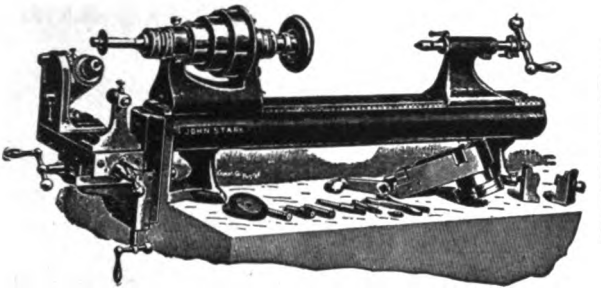
STARK NO. 4 BENCH LATHE



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Length of bed, 38 inches—swing 9 inches—capacity of chuck ¾-in.—weight 185 lbs. STARK LATHE ACCURACY is known and appreciated wherever bench tools are used. We had had 55 years' experience in building these lathes and can guarantee their efficiency absolutely. Ask today for our descriptive Catalogue No. 25.

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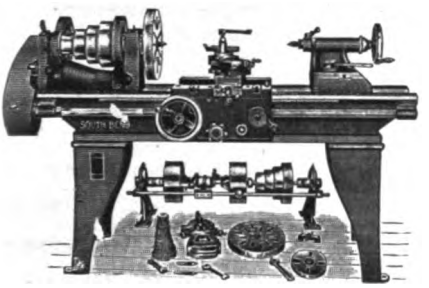
Waltham, Mass.



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For the Machine Shop and Automobile Repair Shop

Straight or Gap Beds	13	inch	South	Bend	Lathe	$256.00
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	16	"	"	"	"	432.00
	18	"	"	"	"	519.00
	21	"	"	"	"	771.00
	24	"	"	"	"	1085.00

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LATHES, Engine (Continued)

Cincinnati Lathe & Tool Co., 3207-11 North St., Cincinnati, O.
Conover-Overkamp Machine & Tool Co., 841 W. Germantown St., Dayton, O.
Dalton Mfg. Co., 1911-15 Park Ave., New York, N. Y.
Davis Machine Tool Co., 305 St. Paul St., Rochester, N. Y.
Duff, William E., York, Pa. (Dealer.) (See page 457.)
Economy—See Rockford Lathe & Drill Co.
Fay & Scott, Dexter, Me.
Fay Machine Tool Co., Philadelphia, Pa.
Fitchburg Machine Works, 64 Main St., Fitchburg, Mass. "Lo-Swing."
Flather & Co., 29 Crown St., Nashua, N. H.
Franklin Mfg. Co., 217-19 N. Watts St., Philadelphia, Pa. "Landis."
Giddings & Lewis Mfg. Co., 142 Doty St., Fond du Lac, Wis.
Gisholt Machine Co., 1315 E. Washington Ave., Madison, Wis.
Hamilton Machine Tool Co., Symmes Ave., Hamilton, O.
Hendey Machine Co., Torrington, Conn.
Landis—See Franklin Mfg. Co.
Le Blond Machine Tool Co., R. K., 4609-21 Eastern Ave. (Linwood), Cincinnati, O.
Lo-Swing—See Fitchburg Machine Works.
Lodge & Shipley Machine Tool Co., 3055 Colerain Ave., Cincinnati, O.
Monarch Machine Tool Co., Sidney, O.
Morris Machine Tool Co., John B., Cincinnati, O.
Mueller Machine Tool Co., 2425-29 Colerain Ave., Cincinnati, O.
Myers Machine Tool Co., Second & Chestnut Sts., Columbia, Pa.
New Haven Mfg. Co., 50 Whitney St., New Haven, Conn.
Niles-Bement-Pond Co., 111 Broadway, New York, N. Y. "Pond."
Pond—See Niles-Bement-Pond Co.
Pratt & Whitney Co., 111 Broadway, New York, N. Y. (See page 73.)
Putnam Machine Co., Newton Pl., Fitchburg, Mass.
Rahn-Larmon Co., 2941 Spring Grove Ave., Cincinnati, O.
Reed-Prentice Co., 677 Cambridge St., Worcester, Mass.
Robbins Machine Co., 42 Lagrange St., Worcester, Mass.
Rockford Lathe & Drill Co., 1827 14th Ave., Rockford, Ill. "Economy."
Rockford Tool Co., Harrison Ave. & 11th St., Rockford, Ill.
Sebastian Lathe Co., Cincinnati, O.
Seneca Falls Mfg. Co., 314 W. Fall St., Seneca Falls, N. Y. "Star."
Shepard Lathe Co., 134-36 Culvert St., Cincinnati, O.
South Bend Lathe Works, 600 E. Madison St., South Bend, Ind. (See page 385.)
Springfield Machine Tool Co., Southern Ave. & P. C. & St. L. R. R., Springfield, O.
Stapf & Co., John B., Dunkirk, N. Y.
Star—See Seneca Falls Mfg. Co.
Von Wyck Machine Tool Co., C. H. & D. R. R., & Elmore St., Cincinnati, O.
Walcott Lathe Co., 4142 Jackson St., Jackson, Mich.
Whitcomb-Blaisdell Machine Tool Co., 134 Gold St., Worcester, Mass.
Willard Machine & Tool Co., Third St. & Madison Ave., Cincinnati, O.

LATHES, Forming

Meriden Machine Tool Co., Meriden, Conn. "Yankee."
Warner & Swasey Co., 5701 Carnegie Ave., Cleveland, O.
Yankee—See Meriden Machine Tool Co.

LATHES, PATTERN MAKERS — See Lathes, Woodworking

LATHES, PRECISION—See Lathes, Bench or Precision

LATHES, Turret

Acme Machine Tool Co., Cincinnati, O.
American Tool Works Co., Sixth & Eggleston Sts., Cincinnati, O.
American Tool & Machine Co., Boston, Mass.
Bardons & Oliver, 1133 W. Ninth St., Cleveland, O.
Boye & Emmes Machine Tool Co., 2245-51 Spring Grove Ave., Cincinnati, O.
Bradford Machine Tool Co., 657 Evans St., Cincinnati, O.
Bullard Machine Tool Co., Bridgeport, Conn.
Cincinnati Lathe & Tool Co., 3207-11 North St., Cincinnati, O.
Davis Machine Tool Co., 305 St. Paul St., Rochester, N. Y.
Dreses Machine Tool Co., 227-39 W. McMicken Ave., Cincinnati, O.
Fay & Scott, Dexter, Me.
Federal Machine Co., 1602-18 S. Lafayette St., South Bend, Ind.
Foster Machine Co., 1100 Beardsley Ave., Elkhart, Ind.
Garvin Machine Co., Spring & Varick Sts., New York, N. Y.
Gisholt Machine Co., 1315 E. Washington Ave., Madison, Wis.
Hamilton Machine Tool Co., Symmes Ave., Hamilton, O.
Hartness—See Jones & Lamson Machine Co.
International Machine Tool Co., 1124 W. 21st St., Indianapolis, Ind. "Libby."
Jones & Lamson Machine Co., Springfield, Vt. "Hartness."
Le Blond Machine Tool Co., R. K., 4609-21 Eastern Ave. (Linwood), Cincinnati, O.
Libby—See International Machine Tool Co.
Lodge & Shipley Machine Tool Co., 3055 Colerain Ave., Cincinnati, O.
Meriden Machine Tool Co., Meriden, Conn.
Monarch Machine Tool Co., Sidney, O.
New Britain Machine Co., New Britain, Conn. (See page 659.)
Potter & Johnston Machine Co., 1035 Newport Ave., Pawtucket, R. I.
Pratt & Whitney Co., 111 Broadway, New York, N. Y. (See page 73.)
Rahn-Larmon Co., 2941 Spring Grove Ave., Cincinnati, O.
Reed-Prentice Co., 677 Cambridge St., Worcester, Mass.
Smurr & Kamen Co., 313 N. Whipple St., Chicago, Ill.
Springfield Machine Tool Co., Southern Ave. & P. C. & St. L. R. R., Springfield, O.
Steinle Turret Machine Co., Madison, Wis. (See page 441.)
Warner & Swasey Co., 5701 Carnegie Ave., Cleveland, O.
Wood Turret Machine Co., Brazil, Ind.

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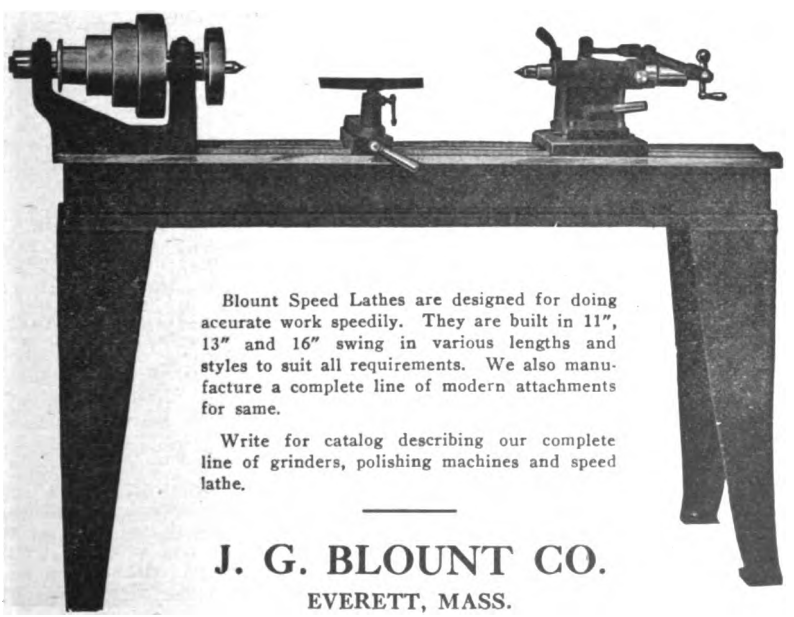

Blount Speed Lathes are designed for doing accurate work speedily. They are built in 11", 13" and 16" swing in various lengths and styles to suit all requirements. We also manufacture a complete line of modern attachments for same.

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American Wood Working Machinery Co., 591 Lyell Ave., Rochester, N. Y.
Cordesman-Rechtin Co., Cincinnati, O.
Defiance Machine Works, 434 Perry St., Defiance, O.
Fay & Egan Co., J. A., 415 W. Front St., Cincinnati, O.
Fay & Scott, Dexter, Me.
Goodspeed Machine Co., 202 Spruce St., Winchendon, Mass.
Ober Mfg. Co., Chagrin Falls, O.
Oliver Machinery Co., Coldbrook & Clancy Sts., Grand Rapids, Mich.
Porter Machinery Co., C. O., 666-68 Front Ave., N. W., Grand Rapids, Mich.
Power & Co., L., 20 S. 23d St., Philadelphia, Pa.
Robbins Machine Co., 42 Lagrange St., Worcester, Mass.
Smith Machine Co., H. B., Smithville, N. J.

LAVA

American Lava Co., Chattanooga, Tenn.
Steward Mfg. Co., D. M., Chattanooga, Tenn.

LEAD MOLDS—See Molds, Lead

LEAF SPRING STRAIGHTENING MACHINES—See Machines, Leaf Spring Straightening

LEAF SPRINGS—See Springs, Leaf

LEATHER, Artificial or Imitation

(For upholstery and tops; for genuine leather—See Leather, Natural)

Barrell Co., Wm. L., New York, N. Y. "Styma," "Leathercoat." (See page 393.)
Blue Robin—See Lawrence & Co.
Broncho—See Zapon Leather Cloth Co.
Bull Dog—See Mutty Co.
Charoleen—See Reilly & Son.
Chase & Co., L. C., Boston, Mass. "Leatherwove." (See page 497.)
Chicago Decorative Leather Co., 426 S. Clinton St., Chicago, Ill. "Elkide."
Dridek—See Mutty Co.
Du Pont Fabrikoid Co., Wilmington, Del. "Fabrikoid," "Rayntite." (See page 169.)
Dura Leather—See Sloane, W. & J.
Duratex Co., Newark, N. J. (See page 389.)
Duxrane—See O'Bannon Corp.
Elkide—See Chicago Decorative Leather Co.
Fabrikoid—See Du Pont Fabrikoid Co.
Gotham—See Zapon Leather Cloth Co.
Hyde-Tex—See International Commercial Co.
International Commercial Co., Brown Bros. Bank Bldg., Philadelphia, Pa. "Hyde-Tex." (See page 393.)
Keratol Co., South & Van Buren Sts., Newark, N. J.
Lawrence & Co., 24 Thomas St., New York, N. Y. (Sole Distributors for Merrimack Mfg. Co., Lowell, Mass.) "Blue Robin."
Leathercoat—See Barrell Co.
Leatherwove—See Chase & Co.
Masland Dura Leather Co.—See Sloane, W. & J.
Merrimack Mfg. Co.—See Lawrence & Co.
Moroccoline—See Zapon Leather Cloth Co.
Muleskin—See Zapon Leather Cloth Co.
Mutty Co., L. J., Boston, Mass. "Bull Dog," "Dridek." (See page 391.)
Nonleek—See O'Bannon Corp.
O'Bannon Corp., 200 Fifth Ave., New York, N. Y. "Nonleek," "Duxrane." (See pages 277 and 389.)
Pantasote Co., 11 Broadway, New York, N. Y.
Randco—See Zapon Leather Cloth Co.
Rayntite—See Du Pont Fabrikoid Co.
Reilly & Son, P., Mott St. & Passaic Ave., Newark, N. J. "Charoleen."
Sloane, W. & J., 575 Fifth Ave., New York, N. Y. (Sole Distributors for Masland Dura Leather Co., Philadelphia, Pa.) "Dura Leather." (See page 393.)
Styma—See Barrell Co.
Textileather Co., 212 Fifth Ave., New York, N. Y.
Zapon Leather Cloth Co., 200 Fifth Ave., New York, N. Y. "Moroccoline," "Broncho," "Muleskin," "Randco," "Gotham."

LEATHER BELTING—See Belting, Leather

LEATHER COATS—See Clothing, Motorists'

LEATHER DRESSING — See Dressing, Leather

LEATHER FAN BELTS—See Belts

LEATHER, Friction

(For lining brakes and clutches—See also Belting, Leather)

American Belting & Tanning Co., 135 Oliver St., Boston, Mass.
Bonner & Barnewell, 30 Church St., New York, N. Y.
Brace Leather Goods Co., 22 Wayne St., Pontiac, Mich.
Chicago Belting Co., 113-25 N. Green St. Chicago, Ill.
Chicago Rawhide Mfg. Co., 1301 Elston Ave., Chicago, Ill.
Coe & Brown, 202-04 George St., New Haven, Conn.
Cortex—See Hide, Leather & Belting Co.
Detroit Leather Specialty Co., 275 Beecher Ave., Detroit, Mich.
Duckwall Belting & Hose Co., 201-05 N. West St., Indianapolis, Ind. (See page 469.)
Excelmo—See Missouri Belting Co.
G & K—See Graton & Knight Mfg. Co.
Graton & Knight Mfg. Co., Worcester, Mass. "G. & K." (See page 99.)
Haney & Co., J. H., Hastings, Neb.
Hide, Leather & Belting Co., 215 S. Meridian St., Indianapolis, Ind. "Wetprufe," "Leathertex," "Cortex." (See page 389.)
Houghton & Co., E. F., 240 W. Somerset St., Philadelphia, Pa. "Vim."
Hudson Belting Co., 1-3 Eaton Pl., Worcester, Mass.
Jewell Belting Co., 55 Trumbull St., Hartford, Conn.
Leathertex—See Hide, Leather & Belting Co.
M. L. B.—See Milwaukee Leather Belting Co.
Milwaukee Leather Belting Co., 146 W. Water St., Milwaukee, Wis. "M. L. B."
Missouri Belting Co., Grand Ave. & La Salle St., St. Louis, Mo. "Excelmo."
National Leather Belting Co., 342 E. 38th St., New York, N. Y.
National Leather Mfg. Co., Niles, Mich.

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LEATHER, Friction (Continued)

Page Belting Co., Concord, N. H.
Providence Belting Co., 25 Charles St., Providence, R. I.
Rahmann & Co., Geo., 31 Spruce St., New York, N. Y.
Schieren Co., Chas. A., 76 Ferry St., New York, N. Y.
Taylor Belting Co., 247 S. Meridian St., Indianapolis, Ind.
Vim—See Houghton & Co.
Wetprufe—See Hide, Leather & Belting Co.
Wilder & Co., 1036 Crosby St., Chicago, Ill.
Williams & Sons, I. B., 9 Orchard St., Dover, N. H.

LEATHER, IMITATION—See Leather, Artificial

LEATHER MEASURING MACHINES—See Machines, Leather Measuring

LEATHER MOULDING—See Moulding, Flexible Leather

LEATHER MUD GUARDS—See Fenders, or Mud Guards, Leather

LEATHER, Natural

(Genuine Leather for upholstery and tops; for Artificial or Imitation Leather—See Leather, Artificial)

American Oak Leather Co., Cincinnati, O.
Arrow—See Ryan Leather Co.
Ashtabula Hide & Leather Co., Ashtabula, O.
Beaver—See Straus & Sons, M.
Black Bear—See Radel Leather Mfg. Co.
Blanchard Bro. & Lane, 20 Bruen St., Newark, N. J.
Boulee-Frazer Leather Co., 234 Canal St., New York, N. Y.
Byron & Sons Leather Co., W. D., Williamsport, Md. "Tanok," "Eureka."
Cleveland Tanning Co., Jennings & Dennison Aves., S. W., Cleveland, O.
Eagle—See Reilly Co.
Eagle-Ottawa Leather Co., 226-28 W. Lake St., Chicago, Ill.
Eureka—See Byron & Sons Leather Co.
General Leather Co., 418 Frelinghuysen Ave., Newark, N. J.
Good, I. C. & H. B., Newark, N. J.
Hertz, Max, 54-68 Oliver St., Newark, N. J.
Howell & Co., T. P., New & Nuttmann Sts., Newark, N. J. "Lion."
Howell-Hinchman Co., Middletown, N. Y.
Lackawanna Leather Co., Hackettstown, N. J.
Lion—See Howell & Co.
Mentz, John J., 64 Marshall St., Newark, N.J.
Ohio Tanning Co., Cincinnati, O.
Pearce Bros. Leather Co., Newark, N. J.
Radel Leather Mfg. Co., Hamburg Place Rd., Newark, N. J. "Black Bear."
Raser Tanning Co., Ashtabula, O.
Reilly & Son, P., Mott St. & Passaic Ave., Newark, N. J. "Stag."
Roser & Son., Hermann, Glastonbury, Conn.
Ryan Leather Co., Woolsey St., Irvington, N. J. "Arrow."
Shields Bros., Bombay, N. Y.
Smith & Sons, L. M., 59 Lock St., Newark, N. J.
Smyth Co., Charles, 240-50 Central Ave., Newark, N. J.
Stag—See Reilly & Son.
Standard Leather Co. of Pittsburgh, 296 Spring Garden Ave., N. S., Pittsburgh, Pa.
Stengel, Geo., Frelinghuysen & Elizabeth Aves., Newark, N. J.
Stengel & Rothschild, Maine & Kossuth Sts., Newark, N. J.
Straus & Sons, M., 440 Frelinghuysen Ave., Newark, N. J. "Beaver."
Tanok—See Byron & Sons Leather Co.
Turner & Rutter, 32 Spruce St., New York, N. Y.
Wilder & Co., 1036 Crosby St., Chicago, Ill.
Wilder Tanning Co., Waukegan, Ill.
Wing Co., Charles, Amesbury, Mass. (Dealers.) (See page 645.)

LEATHER, Rawhide Lace

(For preventing motor hoods or bonnets from rattling; for Fabric Lace—See Lace, Fabric)

Chicago Belting Co., 113-25 N. Green St., Chicago, Ill.
Chicago Rawhide Mfg. Co., 1301 Elston Ave., Chicago, Ill.
Cocheco—See Williams & Son.
Defiance—See Norwich Belt Mfg. Co.
Duckwall Belting & Hose Co., 201-05 N. West St., Indianapolis, Ind. (See page 469.)
Eagle—See Mooney Belting Co.
G & K—See Graton & Knight Mfg. Co.
Gay, Fred E., Olneyville, R. I.
Graton & Knight Mfg. Co., Worcester, Mass. "G. & K." (See page 99.)
H. L. Lacing Co., 136 W. Third St., Cincinnati, O.
Hide, Leather & Belting Co., 215 S. Meridian St., Indianapolis, Ind. (See page 389.)
Jewell Belting Co., 55 Trumbull St., Hartford, Conn.
Missouri Belting Co., Grand Ave. & La Salle St., St. Louis, Mo. "Victor."
Mooney Belting Co., 844 W. Sixth St., Cincinnati, O. "Eagle."
National Leather Belting Co., 242 E. 38th St., New York, N. Y.
National Leather Mfg. Co., Niles, Mich.
Norwich Belt Mfg. Co., Norwich, Conn. "Defiance."
Rahmann & Co., Geo., 31 Spruce St., New York, N. Y.
Richmond Leather Mfg. Co., 2201-07 E. Cary St., Richmond, Va.
Sturges Co., V. K., 26th & Union Sts., Oakland, Cal.
Victor—See Missouri Belting Co.
Weatherhead-Thompson Co., Pawtucket, R. I.
Williams & Sons, I. B., 9 Orchard St., Dover, N. H. "Cocheco."

LEATHER STRAPS—See Straps, Leather

LEATHER TIRES—See Tires, Leather

LEATHER TOPS—See Tops, Automobile

LEATHER TUFTING WASHERS — See Washers, Tufting

LEATHER, UPHOLSTERY—See Leather, Artificial; also Leather, Natural

LEATHER WASHERS — See Washers, LEATHER

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LEGGINGS, Motorists

Atlas Specialty Mfg. Co., 16-22 E. 24th St., Chicago, Ill. "Reliance," "Napoleon," "Tooinone," "Universal," "Boulevard," "Harvard," "National." (See page 123.)

B. E. Mfg. Co., 18-22 W. 18th St., New York, N. Y. (See page 223.)

Boulevard—See Atlas Specialty Mfg. Co.

Chicago Wholesale Saddlery & Mfg. Co., 125-27 N. Halsted St., Chicago, Ill.

Cook & Bro., E. C., 1301-15 Carroll Ave., Chicago, Ill.

Hagerstown Shoe & Legging Co., Hagerstown, Md. "Halco."

Halco—See Hagerstown Shoe & Legging Co.

Harvard—See Atlas Specialty Mfg. Co.

Hoover Co., W. H., New Berlin, O.

Napoleon—See Atlas Specialty Mfg. Co.

Nathan Novelty Mfg. Co., 84-90 Reade St., New York, N. Y. (See page 153.)

National—See Atlas Specialty Mfg. Co.

Premier Auto Novelty Mfg. Co., 375 W. Broadway, New York, N. Y.

Reliance—See Atlas Specialty Mfg. Co.

Syracuse & Eldridge Glove & Legging Co., 107 N. Franklin St., Syracuse, N. Y.

Tooinone—See Atlas Specialty Mfg. Co.

Universal—See Atlas Specialty Mfg. Co.

Wiley-Bickford-Sweet Co., 80 Pliny St., Hartford, Conn.

LENSES, DEFLECTING—See Dimmers, Headlight

LENSES, DIFFUSING—See Dimmers, Headlight

LENSES, DIMMING—See Dimmers, Headlight

LENSES, ORDINARY LAMP—See Glasses, Lamp

LENSES, SPECIAL—See Dimmers, Headlight

LETTERS, STEEL—See Stamps, Steel

LEVER BALLS—See Balls, Composition Control Lever

LEVER ENGINE STARTERS—See Starters, Manual

LEVER EXTENSIONS—See Extensions, Gear Shift Lever

LEVER GRIPS—See Grips, Throttle and Spark

LEVER LOCKS FOR FORDS—See Locks, Spark and Throttle Lever

LEVER STARTERS—See Starters, Manual

LEVERS, Brake and Gear Shift

(Finished or Machined Levers. For Levers in the rough—See Castings; also Forgings)

Baker Gun & Forging Co., Batavia, N. Y. (See page 325.)

Billings & Spencer Co., Laurel & Park Sts., Hartford, Conn.

Brown-Lipe Gear Co., Syracuse, N. Y. (See page 317.)

Cotta Gear Co., 117-29 Morgan St., Rockford, Ill.

Cotta Transmission Co., Rockford, Ill. (See page 321.)

Fuller & Sons Mfg. Co., Kalamazoo, Mich. (See page 621.)

Hazard Motor Mfg. Co., 23 Scherer St., Rochester, N. Y.

Hoosier Auto Parts Co., 718 S. Elliott St., Muncie, Ind.

Konigslow Mfg. Co., Otto E., 3701 Perkins Ave., Cleveland, O.

Piper Machine Co., 560-70 N. Elder Ave., Indianapolis, Ind.

Savage Arms Corp., Sharon, Pa. (See page 213.)

Warner Co., T. W., Kilgore & Perkins Aves., Muncie, Ind.

Warner Gear Co., Muncie, Ind. (See page 414.)

LEVERS, GEAR SHIFT—See Levers, Brake

LEVERS, Tractor Brake and Control

Hoosier Auto Parts Co., 718 S. Elliott St., Muncie, Ind.

LICENSE HOLDERS—See Holders, License

LICENSE NUMBERS — See Numbers, License

LIFE PRESERVERS, AVIATORS—See Preservers, Aviators' Life

LIFTERS, TIRE—See Tools, Tire

LIFTERS, VALVE—See Rods, Adjustable Valve Lift; also Tools, Valve

LIFTING JACKS—See Jacks, Lifting

LIGHT DEFLECTORS—See Dimmers or Shades, Headlight

LIGHT FUSES—See Fuses, Electric

LIGHT REGULATORS FOR FORDS—See Regulators, Electric Light

LIGHT STANDS—See Lights, Wash Stand

LIGHT SWITCHES—See Switches, Light

LIGHTERS, Acetylene Lamp

(See also Burners, Special Acetylene Lamps)

Adjustable Lighter Co., 18 Pearl St., Newton, Mass.

Feeser Co., Frank S., 1102 Prospect St., Indianapolis, Ind. "Superior."

Ideal Brass Works, 560 N. Elder Ave., Indianapolis, Ind.

Rousseau, David, Ossining, N. Y.

Superior—See Feeser Co.

LIGHTERS, Electric Cigar

(For use on car from regular lighting battery)

Century—See Mabeys Electric & Mfg. Co.

Cig-R-Lite—See Electric Automatic Cigar Lighter Co.

Cowles & Co., C., New Haven, Conn. (See page 339.)

Cuno Engineering Corp., 80 S. Vine St., Meriden, Conn.

Electric Automatic Cigar Lighter Co., 556 W. 27th St., New York, N. Y. "Cig-R-Lite."

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LIGHTERS, Electric Cigar (Cont'd)

Gohring—See Taylor Co.

Handy—See Picard & Co.

Holmes, George L., 1733 Broadway, New York, N. Y. (Eastern Distributor for Cuno Lighters.) (See page 383.)

Lalor, W. M., 431 S. Dearborn St., Chicago, Ill.

Mabeys Electric & Mfg. Co., 940 N. Pennsylvania St., Indianapolis, Ind. "Century."

Metal Specialties Mfg. Co., 338-52 N. Kedzie Ave., Chicago, Ill. "Presto." (See page 333.)

Morse, Frank W., 289 Congress St., Boston, Mass. (See page 453.)

O'Brien Mfg. Co., Joseph F., 391 Broadway, New York, N. Y.

Picard & Co., A. J., 9 W. 61st St., New York, N. Y. "Handy." (See page 273.)

Presto—See Metal Specialties Mfg. Co.

Rosco—See Rosen & Co.

Rosen & Co., A. W., 610-14 Broadway, New York, N. Y. "Rosco."

Seco—See Spielman Electric Co.

Spielman Electric Co., 1931 Broadway, New York, N. Y. "Seco."

Taylor Co., H. D., 101-05 Oak St., Buffalo, N. Y. "Gohring."

LIGHTERS, Electric Cigar, for Fords

(For use in car and to operate on current from magneto)

Metal Specialties Mfg. Co., 338-52 N. Kedzie Ave., Chicago, Ill. "Presto." (See page 333.)

Presto—See Metal Specialties Mfg. Co.

LIGHTING BATTERIES—See Batteries, Storage

LIGHTING DYNAMOS—See Dynamos, Electric Lighting

LIGHTING GENERATORS—See Dynamos, Electric Lighting

LIGHTING SYSTEMS—See Systems, Electric Lighting

LIGHTS, Car Locator

(Small lamp with vari-colored glass to attach to roof of closed cars to enable the owner to instantly locate his car)

Car-Locator Light Co., 1931 Broadway, New York, N. Y.

LIGHTS, Curtain

(For Glass Curtain Lights—See Windows, Glass Curtain)

Buob & Scheu, 500-10 Webster St., Cincinnati, O. "Instant." (See page 711.)

H & B—See Holmes & Bostrom Bros.

Holmes & Bostrom Bros., 365 17th Ave., Milwaukee, Wis. "H & B."

Instant—See Buob & Scheu.

National Supply Corp., Milwaukee, Wis. (See page 691.)

LIGHTS, Curtain, for Fords

(Celluloid light or window with fabric or leather binding and special fasteners for replacing damaged rear curtain lights)

Atlas Specialty Mfg. Co., 16-22 E. 24th St., Chicago, Ill. (See page 123.)

Buettner Co., Charles H., Cincinnati, O. "Unisco."

Buob & Scheu, 500-10 Webster St., Cincinnati, O. "Instant." (See page 711.)

Cincinnati Auto Specialty Co., 426 Elm St., Cincinnati, O. "Stik-Tite."

Chicago Wholesale Saddlery & Mfg. Co., 125-27 N. Halsted St., Chicago, Ill.

Gordon Co., J. P., 303 N. Fourth St., Columbus, O. (See page 225.)

H & B—See Holmes & Bostrom Bros.

Holmes & Bostrom Bros., 365 17th Ave., Milwaukee, Wis. "H & B."

Instant—See Buob & Scheu.

Invincible—See Peters & Herron Dash Co.

Metal Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

National Supply Corp., Milwaukee, Wis. (See page 691.)

Peters & Herron Dash Co., Gift St., Columbus, O. "Invincible."

Paragon—See Queen City Mfg. Co.

Powers Mfg. Co., 1340 Sycamore St., Waterloo, Ia.

Queen City Mfg. Co. (Brighton Sta.), Cincinnati, O. "Paragon."

Roberts Co., C. F., 278 Brush St., Detroit, Mich.

Simon & Co., S. C., 404-12 Brown St., Philadelphia, Pa.

Stik-Tite—See Cincinnati Auto Specialty Co

Unisco—See Buettner Co.

LIGHTS, DOME—See Lights, Electric Dome

LIGHTS, Electric Dome

Art Work Shop, 441-49 Ellicott St., Buffalo, N. Y.

Campbell Co., A. S., 276 Commercial St., Boston, Mass. "Cello."

Cello—See Campbell Co.

Columbus Auto Brass Co., Columbus, O. (See page 395.)

Cowles & Co., C., New Haven, Conn. (See page 339.)

Diamond H—See Hart Mfg. Co.

English & Mersick Co., New Haven, Conn. (See page 573.)

Guide Motor Lamp Mfg. Co., Madison Ave., Cleveland, O.

Hart Mfg. Co., Hamilton St., Hartford, Conn. "Diamond H."

Holt & Beebee Co., 106 Brookline Ave., Boston, Mass.

Hudson-Fulton—See Storage Battery Supply Co.

Liberty Works, Egg Harbor City, N. J.

Morse, Frank W., 289 Congress St., Boston, Mass. (See page 453.)

O'Brien Mfg. Co., Joseph F., 391 Broadway, New York, N. Y.

Rosco—See Rosen & Co.

Rosen & Co., A. W., 610-14 Broadway, New York, N. Y. "Rosco."

Storage Battery Supply Co., 239 E. 27th St., New York, N. Y. "Hudson-Fulton."

Superior Lamp Mfg. Co., 136 W. 52d St., New York, N. Y.

Taylor Co., H. D., 101-05 Oak St., Buffalo, N. Y.

Vesta Accumulator Co., 2100 Indiana Ave., Chicago, Ill.

White Mfg. Co., 155 Cannon St., Bridgeport, Conn.

LIGHTS, Electric Flash

(Portable Flash or Pocket Lights or Lanterns)

American Carbon & Battery Co., East St Louis, Ill.

Bailey Co., W. J., Newark, N. J. "Midget."

Burleigh, Geo. K., Penacook, N. H. "Fire Fly."

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LIGHTS, Electric Flash (Continued)

Da-Lite—See Halladay Co.

Delta Electric Co., 313-405 E. Fourth St., Marion, Ind.

Federal Sign System, Lake & Desplaines Sts., Chicago, Ill.

Fire Fly—See Burleigh, Geo. K.

French Battery & Carbon Co., Madison, Wis. (See page 395.)

Halladay Co., L. P., 501 N. Monroe St., Streator, Ill. "Da-Lite."

Kwik-Lite—See Usona Mfg. Co.

Lightning Bug—See Stewart-Skinner Co.

Metal Specialties Mfg. Co., 338-52 N. Kedzie Ave., Chicago, Ill. "Presto." (See page 333.)

Midget—See Bailey Co.

O-U-Lyte—See Weder Co.

Presto—See Metal Specialties Mfg. Co.

Rosco—See Rosen & Co.

Rosen & Co., A. W., 610-14 Broadway, New York, N. Y. "Rosco."

Stewart-Skinner Co., 17 Green St., Worcester, Mass. "Lightning Bug."

Universal Carbon Co., First St. & Riverside Ave., Dundee, Ill.

Usona Mfg. Co., 1 Hudson St., New York, N. Y. "Kwik Lite."

Weder Co., 4545 Germantown Ave., Philadelphia, Pa. "O-U-Lyte."

LIGHTS, ELECTRIC GAGE—See Lamps, Electric Dash

LIGHTS, ELECTRIC HEAD—See Headlights, Electric

LIGHTS, DOME—See Lights, Electric Dome

LIGHTS, GAGE—See Lamps, Electric Dash

LIGHTS, HEAD—See Lamps, Acetylene; also Headlights, Electric

LIGHTS, POCKET—See Lights, Electric Flash

LIGHTS, Spot

(For attachment to Wind Shield)

American Auto Lamp Co., 20 Desbrosses St., New York, N. Y.

Anderson Electric Specialty Co., 118-24 S. Clinton St., Chicago, Ill. "Autoreelite." (See page 495.)

Aut-O-Lite—See Lipman Air Appliance Co.

Autoreelite—See Anderson Electric Specialty Co.

B & L Auto Lamp Co., 103-05 Mott St., New York, N. Y. (See page 487.)

Bridgeport Metallic Works, Fairfield, Conn.

Brown Mfg. Co., John W., Columbus, O. (See page 381.)

Corcoran-Victor Co., 712 Reading Rd., Cincinnati, O. "Victor."

Culver-Stearns Mfg. Co., Detroit, Mich. (See page 381.)

De Luxe—See Indiana Lamp Co.

Delta Electric Co., 313-405 E. Fourth St., Marion, Ind.

Edmunds & Jones Corp., 436 Lawton Ave., Detroit, Mich.

Fulton-Bell Co., Pittsburgh, Pa.

Faw, J. H., 37 Warren St., New York, N. Y. (Eastern and Southern Distributors for Culver-Stearns Lamps.) (See page 387.)

Flexolight—See Trolley Supply Co.

Gray & Davis, Boston, Mass. (See page 651.)

Hawthorne Mfg. Co., 35 Spruce St., Bridgeport, Conn. "Old Sol."

Howe Mfg. Co., Chicago, Ill.

Indiana Lamp Co., Connersville, Ind. "De Luxe." (See pages 546 and 547.)

K-D Lamp Co., Cincinnati, O. (See page 381.)

Kaufmann & Sons, Chas., 1623 E. First St., Santa Ana, Cal.

Kilbourn-Sauer Co., Fairfield, Conn.

Lipman Air Appliance Co., 206 Pleasant St., Beloit, Wis. "Aut-O-eye."

Mechanical Utilities Co., 5 N. La Salle St., Chicago, Ill.

Old Sol—See Hawthorne Mfg. Co.

Parabolite—See Pittsburgh Electric Specialties Co.

Pittsburgh Electric Specialties Co., 396 Broadway, New York, N. Y. "Parabolite."

Pittsburgh Lamp, Brass & Glass Co., Pittsburgh, Pa.

Red Spot—See Wakefield Brass Co.

Rosco—See Rosen & Co.

Rosen & Co., A. W., 610-14 Broadway, New York, N. Y. "Rosco."

S & M Lamp Co., 118 W. 36th Pl., Los Angeles, Cal.

Stewart-Warner Speedometer Corp., Chicago, Ill. (See page 499.)

Superior Lamp Mfg. Co., 136 W. 52d St., New York, N. Y.

Trolley Supply Co., Canton, O. "Flexolight."

Vesta Accumulator Co., 2100 Indiana Ave., Chicago, Ill.

Victor—See Corcoran Victor Co.

Wakefield Brass Co., F. W., 105 Water St., Vermilion, O. "Red Spot."

Williams Mfg. Co., 125 W. 35th St., Los Angeles, Cal.

LIGHTS, Spot, for Fords

(For attachment to Wind Shield)

Culver-Stearns Mfg. Co., Detroit, Mich. (See page 381.)

Delta Electric Co., Marion, Ind.

Detroit Starter Co., 30-32 E. Larned St., Detroit, Mich. "Dynolite."

Dynolite—See Detroit Starter Co.

Faw, J. H., 37 Warren St., New York, N. Y. (Eastern and Southern Distributors for Culver-Stearns Lamps.) (See page 387.)

Hawthorne Mfg. Co., 55 Spruce St., Bridgeport, Conn.

LIGHTS, Wash Stand

(For lighting car on wash stand)

Aladdin—See Smith Mfg. Co.

Coffin Valve Co., Tolman St., Neponset, Mass. "Neponset."

Muller, Edward, 1304 John St., West New York, N. J.

Neponset—See Coffin Valve Co.

Smith Mfg. Co., I. J., 1007 Ave Q, Brooklyn, N. Y. "Aladdin."

Universal Electric Stage Lighting Co., 240 W. 50th St., New York, N. Y.

LIMIT GAGES—See Gages, Limit

LIMOUSINE LIGHTS—See Lights, Electric Dome

LIMOUSINE TELEPHONES—See Telephones, Limousine

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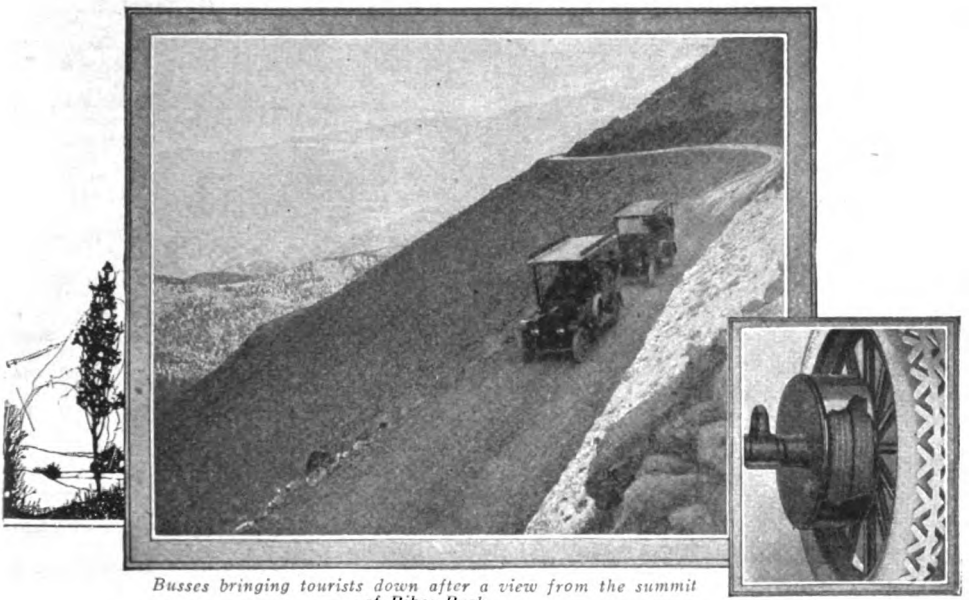

Busses bringing tourists down after a view from the summit of Pikes Peak

The most popular mountain climb in the United States

THE summit of Pikes Peak sees more visitors each year than any other real mountain in the United States. With the aid of the cog-railway and automobiles it is estimated that 44,000 people reach the top. Each year more and more people are making the climb by motor car. Last year the Pikes Peak Automobile Company, which operates the bus line up the mountain, carried 7,000 people.

To insure the safety of so many passengers up and down the steep grades of the mountain, it is of vital importance that the brakes on these motor busses shall be absolutely dependable. Even the slightest slip might result in a most disastrous accident.

How the tourists are protected

Like so many other companies facing the same kind of problem, the company operating these busses have standardized on Thermoid Brake Lining to protect the lives of their passengers.

After thorough tests they decided that Thermoid gave long and more dependable service for three reasons.

1st—Contains 40% more material and 60% more labor than ordinary woven brake lining. This gives long wear.

2nd—It is Grapnalized, a special exclusive process which enables Thermoid to resist moisture, oil and gasoline.

3rd—Thermoid is Hydraulic Compressed. It wears down slowly and can be used until cardboard thin.

The brake lining that meets the exacting test of mountain roads is surely the brake lining for you to select to give your customers lasting satisfaction.

Every foot of Thermoid that you attach is backed by *our guarantee: Thermoid will make good—or WE WILL.*

Thermoid Brake Inspection Chart

At speed of	A car should stop in
10 miles per hr.	9.2 ft.
15 " " "	20.8 "
20 " " "	37 "
25 " " "	58 "
30 " " "	83.3 "
35 " " "	104 "
40 " " "	148 "
50 " " "	231 "

Will your car do this?

Thermoid Rubber Company

Factory and Main Offices: Trenton, N. J

FACTORY BRANCHES:

New York, Detroit, Pittsburgh, Turin, Chicago, Los Angeles, Boston, Paris, San Francisco, Philadelphia, London

Canadian Distributors:
The Canadian Fairbanks-Morse Company, Limited, Montreal
Branches in all Principal Canadian Cities

Thermoid GRAPNALIZED WONT GRAB OR SLIP

Thermoid HYDRAULIC COMPRESSED 100% BRAKE LINING

Thermoid GRAPNALIZED WONT GRAB OR SLIP

Makers of "Thermoid Crolide Compound Casings" and "Thermoid-Hardy Universal Joints"

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LIMOUSINE VENTILATORS—See Ventilators, Limousine and Fore-door

LIMOUSINE WATCHES—See Watches, Limousine

LINED HOSE—See Hose, Metal Lined

LINEN, Aeroplane

(See also Fabric, Aircraft)

Courtrai Mfg. Co., 115 Franklin St., New York, N. Y.

McBratney & Co., Robert, 121 Franklin St., New York, N. Y.

LINING, Body or Frame

(For use between body sill and steel frame to prevent squeaking)

American Mills Co. of New York, 395 Broadway, New York, N. Y.

Bond Co., Charles, 520 Arch St., Philadelphia, Pa. "Fabritex."

Curry Co., J. W., 2615 Cummins St., Cincinnati, O.

Deco—See Dafoe-Eustice Co.

Dafoe-Eustice Co., 1164-72 W. Jefferson Ave., Detroit, Mich. "Deco." (See page 227.)

Fabritex—See Bond Co.

Gilmer Co., L. H., Philadelphia, Pa. (See page 103.)

Hide, Leather & Belting Co., 215 S. Meridian St., Indianapolis, Ind. (See page 389.)

Horton Mfg. Co., F. L., 36 Whittier St., Roxbury, Mass. (See page 431.)

Landers Bros. Co., Blucher & Buckingham Sts., Toledo, O.

Powers Mfg. Co., 1340 Sycamore St., Waterloo, Ia.

Russell Mfg. Co., Middletown, Conn. (See page 415.)

Smith Belting Co., Manning J., 39 E. Ashmead St. (Germantown), Philadelphia, Pa. (See page 101.)

Standard Woven Fabric Co., Walpole, Mass. (See page 787.)

Western Felt Works, 4115-33 Ogden Ave., Chicago, Ill.

LINING, Brake

(For lining brakes or clutches—See also Leather, Friction; also Belting, Leather; also Fibre, Hard)

A-B-C—See American Brake-Lining Co.

Advance Automobile Accessories Corp., Dept. K10-1, 56 E. Randolph St., Chicago, Ill. (See page 423.)

Advance Packing & Supply Co., 11 N. Franklin St., Chicago, Ill. "Brakebestos."

Ajax—See Asbestos & Rubber Works of America.

Ambesco—See American Asbestos Co.

Ambler Autobestos—See Keasbey & Mattison Co.

American Asbestos Co., 1210 Stanbridge St., Norristown, Pa. "Ambesco." (See page 415.)

American Brake-Lining Co., Lansdale, Pa. "A-B-C." (See page 415.)

Appleby & Co., T. H., 107 N. Franklin St., Syracuse, N. Y. "Trubestos."

Arno—See Cincinnati Rubber Mfg. Co.

Asbestos & Rubber Works of America, 1790 Broadway, New York, N. Y. Motobestos. "Ajax." (See page 425.)

Axwell Equipment Co., 214 Wood St., Pittsburgh, Pa.

Bestbestos—See Federal Asbestos Co.

Blue Edge—See Woven Steel Hose & Rubber Co.

Brakébestos—See Advance Packing & Supply Co.

C. A. S. Engineering Co., 790 Woodward Ave., Detroit, Mich. (Sole Distributors for Kelso Mfg. Co., Trenton, N. J.)

Cincinnati Rubber Mfg. Co., Cincinnati, O. "Arno." (See page 361.)

Diamond N—See Norristown Magnesia & Asbestos Co.

Edkin—See Germann Bronze Co.

Elektra—See Horton Mfg. Co.

Embestos—See Empire Rubber & Tire Co.

Empire Rubber & Tire Co., Mulberry St. & Clinton Ave., Trenton, N. J. "Embestos."

Empire Weaving & Belting Corp. (East Rochester), Rochester, N. Y.

Erbestos Brake Lining Co., 242 N. 17th St., Philadelphia, Pa.

Essex Rubber Co., Trenton, N. J.

Federal Asbestos Co., Van Houten St., Paterson, N. J. "Bestbestos."

Garco—See General Asbestos & Rubber Co.

General Asbestos & Rubber Co., Charleston, S. C. "Garco." (See Back Cover.)

Germann Bronze Co., 355 W. 19th St., Erie, Pa. "Edkin."

Horton Mfg. Co., F. L., 36 Whittier St., Roxbury, Mass. "Elektra." (See page 431.)

Howe Mfg. Co., Chicago, Ill. "Kork-Tred."

J-M Non-Burn—See Johns-Manville Co.

Johns-Manville Co., H. W., Madison Ave. & 41st St., New York, N. Y. "J-M Non-Burn."

Kelso Mfg. Co.—See C. A. S. Engineering Co.

Keasby & Mattison Co., Ambler, Pa. "Ambler Autobestos."

Kork-Tred—See Howe Mfg. Co.

Longwear—See Wearwell Gasket & Packing Co.

Motobestos—See Asbestos & Rubber Works of America.

Multibestos—See Standard Woven Fabric Co.

Norristown Magnesia & Asbestos Co., Norristown, Pa. "Diamond N."

Raybestos Co., Bridgeport, Conn. "Stability." (See page 341.)

Rusco—See Russell Mfg. Co.

Russell Mfg. Co., Middletown, Conn. "Rusco." (See page 415.)

S-M-C—See Staybestos Mfg. Co.

Scandinavia Belting Co., 106 Reade St., New York, N. Y.

Shepard Circular Fabric Co., 7-11 Summer St., Worcester, Mass.

Smith Belting Co., Manning J., 39 E. Ashmead St. (Germantown), Philadelphia, Pa. (See page 101.)

Stability—See Raybestos Co.

Standard Brake Lining Co., Gleasondale, Mass.

Standard Woven Fabric Co., Walpole, Mass. "Multibestos." (See page 787.)

Staybestos Mfg. Co., 5534 Lena St. (Germantown), Philadelphia, Pa. "S-M-C," "Universal."

Thermoid Rubber Co., Trenton, N. J. (See pages 373 and 397.)

Trubestos—See Appleby & Co.

Universal—See Staybestos Mfg. Co.

Wearwell Gasket & Packing Co., Camden, N. J. "Longwear." (See page 501.)

Woven Steel Hose & Rubber Co., Trenton, N. J. "Blue Edge." (See page 415.)

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Motor Truck Crankshafts

Experience has taught us how to finish crankshafts in a way to insure the best and most lasting service in motor trucks.

Truck makers send us their crankshaft forgings in the rough, and we return them, **completely finished,** ready for installation.

We know how to grind a crankshaft until it is just right! We have the equipment for drilling oil passages that will insure proper lubrication. And when we polish a crankshaft bearing it is as smooth as glass. Motor truck engine makers say that crankshafts finished in our factory make smoother running motors.

A heavy duty crankshaft, of the sort required in motor trucks, must have a special finish. We have the equipment—the largest and best in the world—for giving them this fine finish. And we have expert workmen who know how to use our equipment.

Automobile Crankshaft Corporation

Detroit, U. S. A.

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Heat Control

"Heat Treatment"—annealing, case hardening and tempering—determine more than anything else the quality of the finished product.

"Heat Control"—the secret of heat treatment—is reduced to an exact science in our plant.

Your valves, bolts and special parts are heat treated in furnaces whose temperatures are indicated by electrical pyrometers so sensitive that even a variation of less than five degrees is easily seen. An elaborate valve control system centralized at the pyrometer room enables these variations of temperature to be promptly corrected.

No element of chance enters into our heat treatment. The temperature is tested—controlled—KNOWN.

A DEPARTMENT
OF YOUR PLANT
FOR

Motor Valves
Spring Shackle Bolts
King Bolts
Chassis Bolts
Coupling Bolts
Connecting Rod Bolts
Push Rods or Valve Tappets
Drag Links
Brake Rod Assemblies
Starting Cranks
Lamp Brackets
Tank Straps
Propeller Tubes
U. S. S. Head Cap Screws
Piston Pins

The Steel Products Co.

Michigan Plant
Detroit, Mich.

Main Plant
Cleveland, O.

Metals Welding Plant
Cleveland, O.

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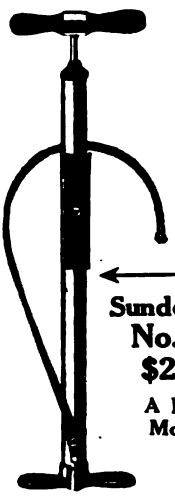
Sunderland Tire Pumps

The Pumps with the Red Band

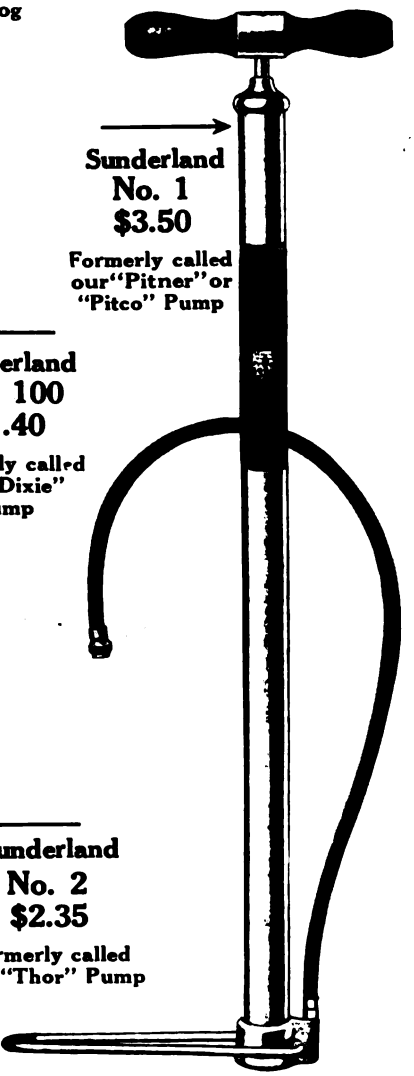
Over 300 Jobbers Carry Them in Stock

Write for Catalog

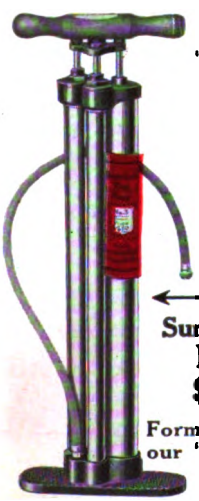


Sunderland No. 10 $2.25
A New Model

Sunderland No. 100 $1.40
Formerly called our "Dixie" Pump



Sunderland No. 1 $3.50
Formerly called our "Pitner" or "Pitco" Pump



Sunderland No. 3 $4.50
Formerly called our "Hercules"

Sunderland No. 2 $2.35
Formerly called our "Thor" Pump

Sunderland Mfg. Co., 602 West 22nd Street, Chicago, Ill.

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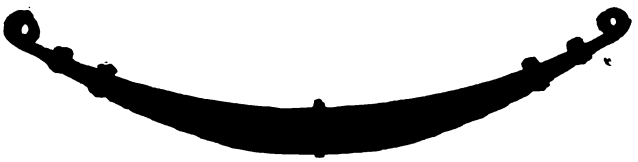
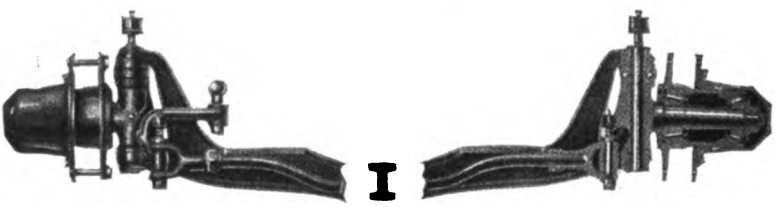


SHELDON'S PRELIMINARY RECOMMENDATIONS FOR TRUCK EQUIPMENTS FROM 1-2-TON TO 5-TON CAPACITY



I

SHELDON

THE HIGHEST PRICED AXLES AND SPRINGS BUILT IN AMERICA AND WORTH ALL THEY COST

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½ Ton Truck Equipment

FRONT AXLE. Model D-260, Track 56", Spoke Width 1⅜", Spring Centers 28½", Width Springs 2", Dia. Clip Hole, 17/32".

REAR AXLE. Model W-1000, Track 56", Spoke Width 1½", Spring Centers 39", Spring Width 2½", Dia. Spring Clip Hole 17/32", Worm Gear Ratio 6.2 to 1, H.P. at 1000 R.P.M. 15.

SPRINGS. Front, Width, 2", Length 36". Rear, Width 2½", Length 50".

¾ Ton Truck Equipment

FRONT AXLE. Model 33-FA-500, Track 56", Spoke Width 1¾", Spring Centers, 32", Width Springs 2¼", Dia. Clip Hole 17/32".

REAR AXLE. Model W-1500, Track 57", Spoke Width 1¾", Spring Centers 39", Width Spring 2½", Dia. Spring Clip Hole 25/32", Worm Gear Ratio 6.5 to 1, H. P. Allowed at 1000 R. P. M., 25.

SPRINGS. Front, Width 2¼. Length 38". Rear, Width 2½", Length 52".

1 Ton Truck Equipment

FRONT AXLE. Model D-343, Track 56", Spoke Width 2", Spring Centers 29", Width Springs 2¼", Dia. Clip Hole 21/32".

REAR AXLE. Model W-102, Track 59½" and 62", Spoke Width 2", Spring Centers 39" and 40", Spring Width 2½", Dia. Spring Clip Hole 25/32", Worm Gear Ratio 7.7 to 1, H. P. Allowed at 1000 R. P. M. 30.

SPRINGS. Front, Width 2¼", Length 40". Rear, Width 2½", Length 54".

2 Ton Truck Equipment

FRONT AXLE. Model 3-FA-10, Track 56", Springs 2½", Dia. Clip Centers 30", Width Springs 2", Dia. Clip Hole 21/32".

REAR AXLE. Model W-21, Track 58", Spoke Width 2½", Spring Centers 39", Spring Width 3", Dia. Spring Clip Hole 29/32", Worm Gear Ratio 7.7 to 1, H. P. Allowed at 1000 R. P. M. 40.

SPRINGS. Front, Width 2½", Length 44". Rear, Width 3", Length 56".

3 Ton Truck Equipment

FRONT AXLE. Model 4-FA-20, Track 62", Spoke Width 2½", Spring Centers 36½", Width Springs 3", Dia. Clip Hole 21/32".

REAR AXLE. Model W-30, Track 66", Spoke Width 3", Spring Centers 42", Spring Width 3½", Dia. Spring Clip Hole 1 1/16", Worm Gear Ratio 8.7 to 1, H. P. Allowable at 1000 R. P. M. 52.

SPRINGS. Front, Width 3", Length 46". Rear, Width 3½", Length 60".

5 Ton Truck Equipment

FRONT AXLE. Model 5-FA-30, Track 68", Spoke Width 3", Spring Centers 39", Width Springs 3½", Dia. Clip Hole 13/16".

REAR AXLE. Model W-50, Track 74⅝", Spoke Width 3½", Spring Centers 49", Spring Width 4", Dia. Spring Clip Hole 1 5/32", Worm Gear Ratio 11.7 to 1, H. P. Allowable at 1000 R. P. M. 45.

SPRINGS. Front, Width 3½", Length, 50". Rear, Width 4", Length 62".

The Sheldon Axle and Spring Co.

Wilkes-Barre, Penn.

Licensed under the Kardo Patents

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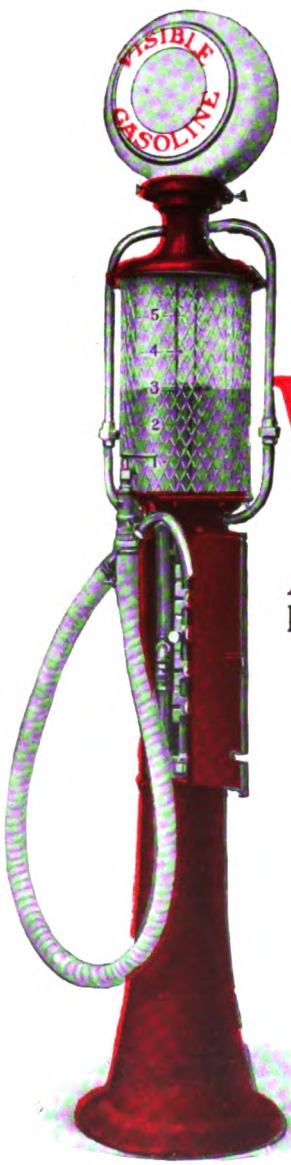
Visible Gasoline Measurement



"Blind" filling stations cannot compete with **visible** measurement. Every owner prefers to buy gas where he has proof of honest quantity. So would you. So will any man. Trade rapidly follows installation of—

Guarantee VISIBLE PUMP

Approved by The Underwriters' Laboratories of the National Board of Fire Underwriters.

Nothing else so quickly builds business as this pump. Gas sales increase tenfold. Sundries, repair jobs and profits grow, all along the line. Quick, prompt, efficient service. Customers *see* what they're buying and you *know* what you sell. Here is the *best* advertisement you can have and it earns money all the time. Write us to-day for catalog and full particulars.

Guarantee Liquid Measure Co.
Rochester, Pa.

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We have many orders and inquiries on hand—

Will you fill them for us in your town?

How It Works

The round bull's eye is red and is operated as the ordinary tail light, and reflects a white light on the license plate. The parallelogram just above the bull's-eye is green, which comes on as a caution light, when slowing down or coming to a stop, and when making your turn, the caution light comes on and the Semaphore swings up to the right for a right hand turn and swings to the left for a left hand turn. When not in use, the semaphore is not visible. The Parallelogram is illuminated at night by an electric light. The triangle in the Semaphore is also red and is illuminated at night by an electric light. In short, it is adapting the well-known Semaphore signal system of the railroads to the operation of automobiles, colored semaphore by day and colored lights by night.

Write us today for our terms to dealers

The popularity of our signal is increasing daily, as evidenced by the orders received, inquiries on hand, and applications for exclusive sales agencies.

The Safety Signal Semaphore is best and most easily sold when it is demonstrated in actual use. That's why we want a representative in every town in the United States.

You can sell one to every car owner in your town and there is a good profit in it for you—but before you preach "safety" you will have to practice it in order that people will be impressed with what you say.

Write us today and we will send you our terms, which we know will interest you.

SAFETY SIGNAL CORPORATION
GALESBURG ILLINOIS

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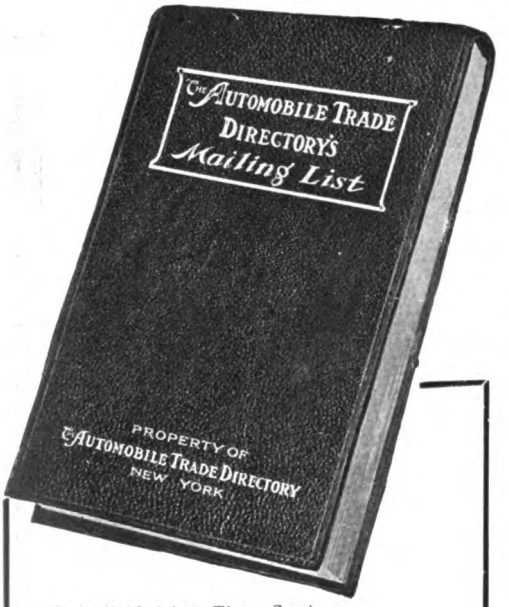
Here is a real "War-Time" Mailing List of the Automobile Industry



It is divided into Three Sections.

Section 1
The names of all Automobile, Commercial Vehicle, Tractor and Motor Manufacturers, together with the names and initials of their purchasing Agents, Engineers, Superintendents and other officials.

Section 2
The names and addresses of all Jobbers and Exclusive Supply Houses handling Automobile Accessories, including hardware, electrical, sporting goods and mill supply dealers. The following information is given regarding them:

1—Main line handled.
2—Number of salesmen traveled.
3—Territory covered.
4—Amount of stock carried.
5—Percentage of business, wholesale, retail and mail order.
6—Buyer's name.
7—Whether a catalog is issued.

Section 3
All legitimate Dealers (giving the cars and trucks handled), Garages and Repair Shops. All concerns in this section who have a supply department are specially designated.

DURING these times when every dollar counts—when "economy is a patriotic duty"—you need more than ever the services of The Automobile Trade Directory's Mailing List.

It not only puts you in direct personal touch with all the possible distributors of your goods—but it keeps you posted on every change of name and address in the industry—thus saving you many dollars in waste "printed matter and postage."

In the automobile industry there were over 40,000 changes during the past year—in this count are included 10,778 concerns who went out of the trade while 10,322 new concerns came in.

From this you can readily see that the cost of keeping such a complete list would be prohibitive for any one manufacturer.

Write us today and we will tell you how you can immediately obtain this service.

THE AUTOMOBILE TRADE DIRECTORY, Inc.
Robert Wolfers, President
243-249 West 39th Street, New York

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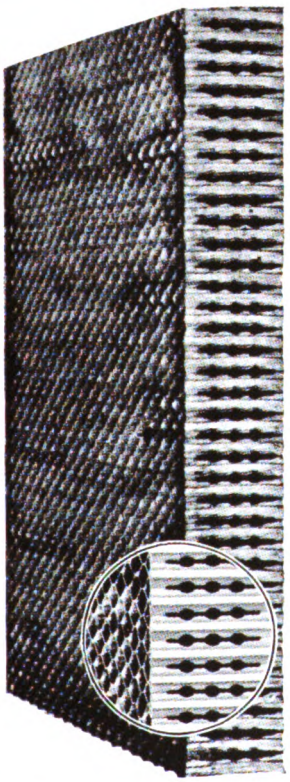
THE HOOVEN RADIATOR



Whether for truck, tractor or aeroplane, the Hooven Radiator offers better cooling, greater strength, longer life, more rigidity and greater value than any other cooling system on the market.

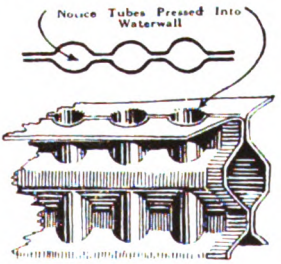
It represents a new idea in radiator construction, in which the advantages of both the tubular and honeycomb types are combined without the disadvantages of either.

Here are some of the points in which the Hooven excels:

- It has 35% to 40% greater cooling efficiency.
- It will not clog.
- It will not leak.
- It is practically immune to freezing.
- It keeps the engine cool constantly at the point of highest efficiency.
- It is easily repaired at small cost.
- It is exceptionally strong, its vertical tubes being braced at every point by a zigzag waterwall.
- It is very light in weight.
- It stands the hardest kind of service.
- It is simple and durable in construction.

These are practical reasons why the Hooven should appeal to truck, tractor and aeroplane makers. A sample radiator will be sent on request, for testing by your engineers. Find out the truth of these statements by a test.

We also offer dealers a splendid proposition on selling Hooven Radiators for replacements.



Hooven Radiator Company

517 W. Monroe Street Chicago, Ill.

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STANDARD PARTS

Standard Parts for Motor Cars, Trucks, Tractors, Airplanes, Motorcycles and Other Vehicles

Axles	**Perfection Springs**
Axles (dead rear)	**(regular and thin leaf)**
Axles, trailer	**Perfection Heaters**
Beck Bearings	**Stanweld Rims**
Hubs	**and Tubing**

OTHER STANWELD PRODUCTS

Rims—clincher detachable and demountable for single and dual equipment
Clincher Rims
Detachable Rims for Wire Wheels, special
Millimeter Rims, all types
Rim Tools
Flanges and Fittings Solid Tire Demountable Equipment
Tire Bases in Demountable and Pressed on Channels
Brake Rod Assemblies, complete
Starting Cranks
Electric Welding of Parts
Exhaust Tubes
Bands S. A. E.
Formed Tubing
Forging for Convertible Trucks
Ignition Wiring Tubes
Lamp Brackets
Mast Sleeves
Oil Tubes
Radiator Rods
Starting Gear Rings and Boxes
Straight Steel Tubing
Steering Gear Tubing
Tail Pipes
Torsion Tubes
Truss Rods
Tubing (straight and formed)

First Comes the Government
Then You, With All Our Might!

Our attitude in this matter is *your* attitude—in proportion as you help us serve the Government, *you* are serving it.

By doubling and redoubling our efforts and by utilizing our vast facilities and resources to the utmost, we are straining to take care of trade needs.

Working together in this spirit we shall jointly aid our country and protect our mutual trade interests.

THE STANDARD PARTS COMPANY

Executive Offices, Cleveland, Ohio

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PERFECTION MOTOR-CAR HEATERS

Type D

Type A

Exceptional Opportunity for

Perfection Heaters—Order at Once

Existing motor cars will be more generally used this fall and winter than ever before.

Garage installation of Perfection Heaters will be exceptionally large, with dealers looking to the Jobbing Trade for supplies.

The increase of 300 per cent in the sales of Perfection Heaters for motor cars indicates the thriving condition in this business.

It is wisdom to order now.

THE STANDARD PARTS COMPANY

Perfection Heater Div'n, Cleveland, Ohio

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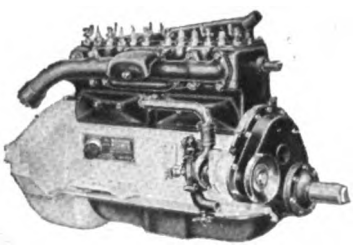
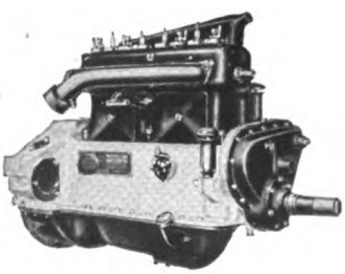
Look for the Red Seal Continental Motor— It Assures You a High-Grade Truck



America's Standard Passenger Car Motor. Look for the Red Seal Nameplate.



America's Standard Truck Motor. Look for the Red Seal Nameplate.

The Continental Red Seal Motor enjoys the full confidence of truck and automobile buyers.

They know what this famous motor will do—know they can rely on it for power, for economy, for speed, for silence, for durability, for *every* motor quality. They look upon the Red Seal as a guarantee against motor experiments.

The most convincing evidence of what a motor *can do* is the record of what it *has done*, and in this we find the reason why the public believes so implicitly in the Continental Red Seal Motor. Fifteen years of successful performance in hundreds of thousands of trucks and cars provides sure evidence of its worth.

Striking endorsement of this confidence of the public in the Continental is seen in the fact that today over 160 vehicle manufacturers use it in one or more models of their trucks and automobiles. Thus upon it they stake the success of their product and an investment of many millions of dollars.

When you buy a truck or automobile look for the Continental Red Seal on the motor—the mark of proved worth.

CONTINENTAL MOTORS CORPORATION

Offices: Detroit, Michigan — **Factories:** Detroit—Muskegon

Largest Exclusive Motor Manufacturers in the World

Continental Motors

AMERICA'S STANDARD POWER FOR TRUCKS AND AUTOMOBILES

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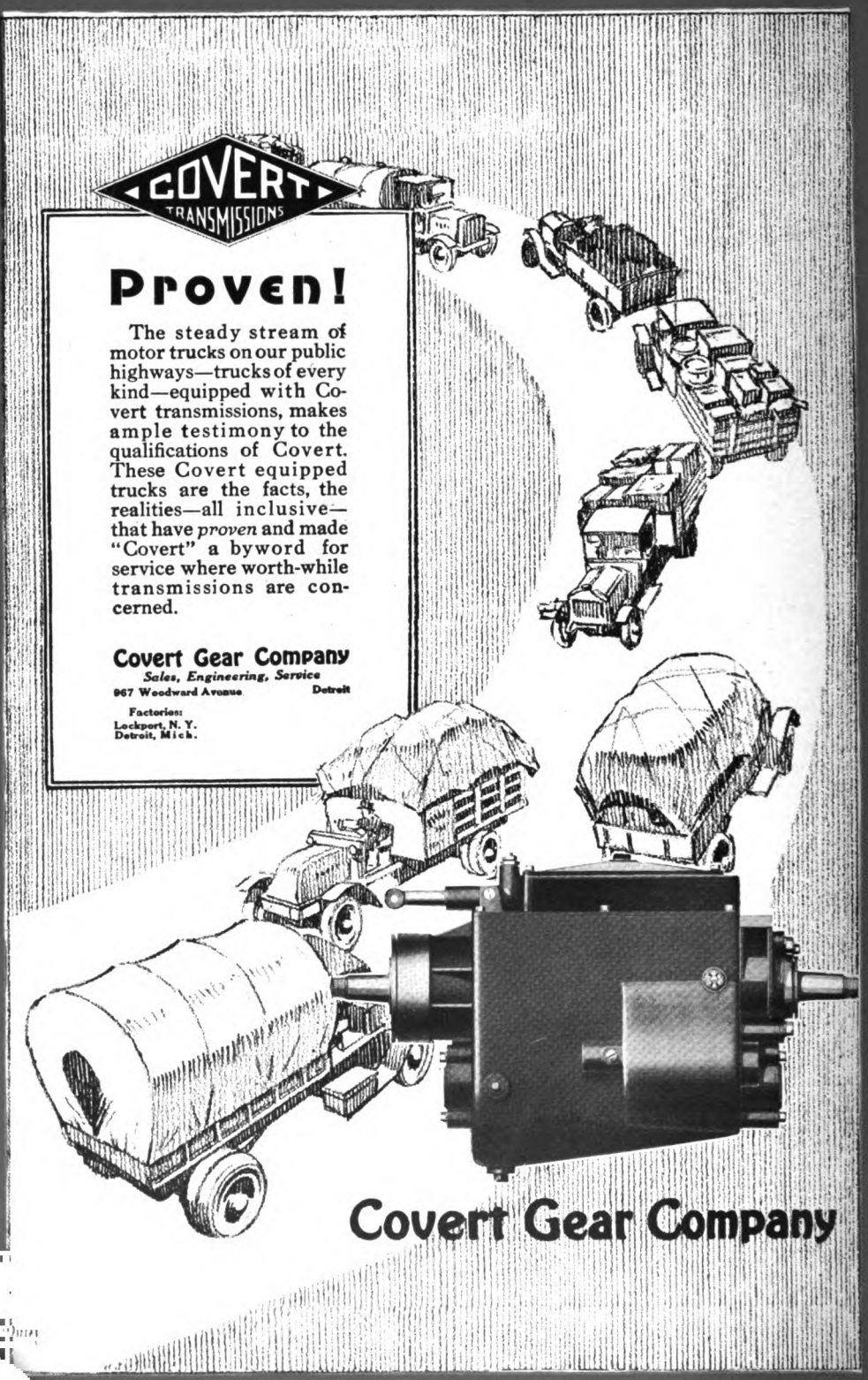

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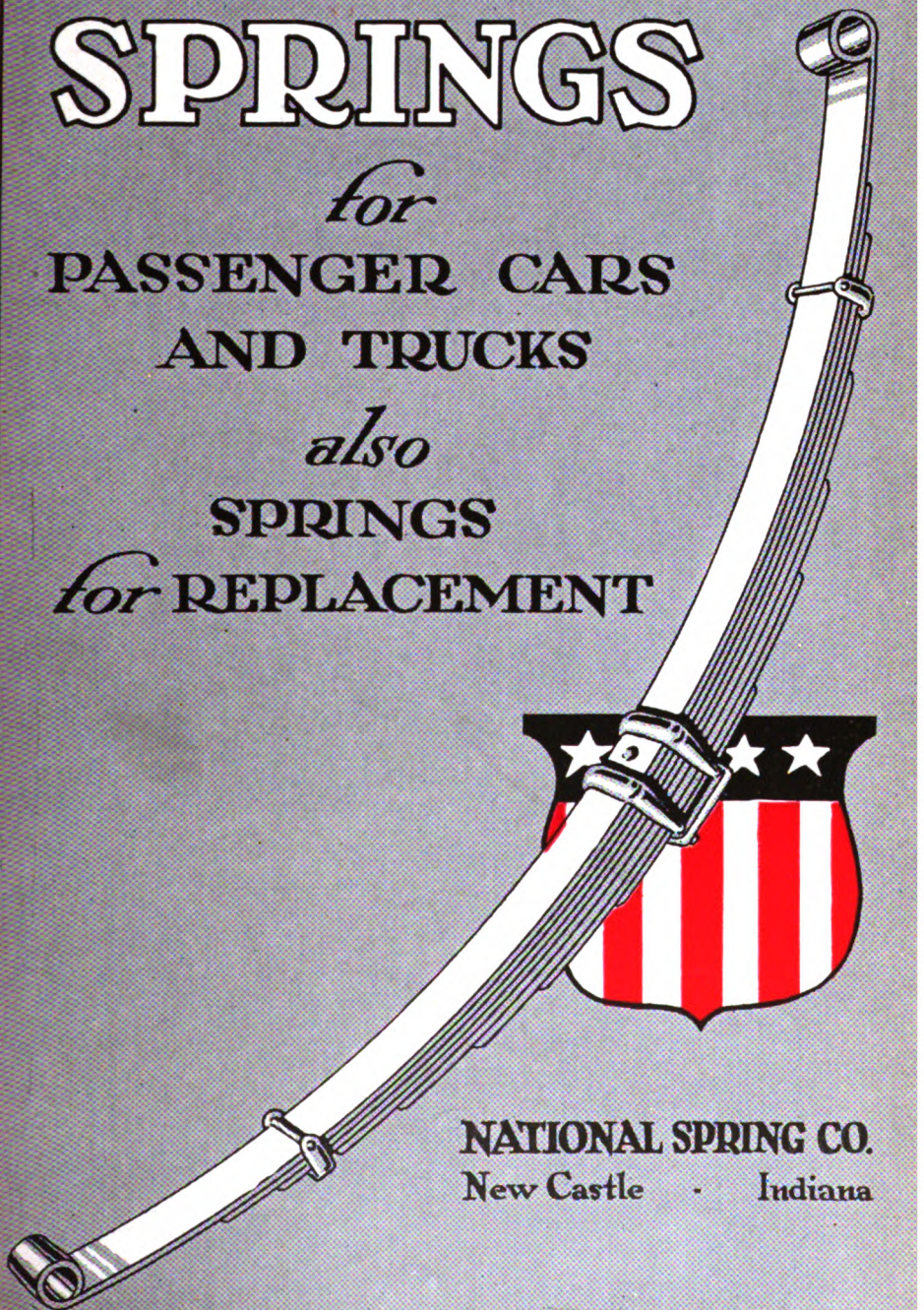
for

PASSENGER CARS AND TRUCKS

also

SPRINGS *for* REPLACEMENT



NATIONAL SPRING CO.

New Castle · Indiana

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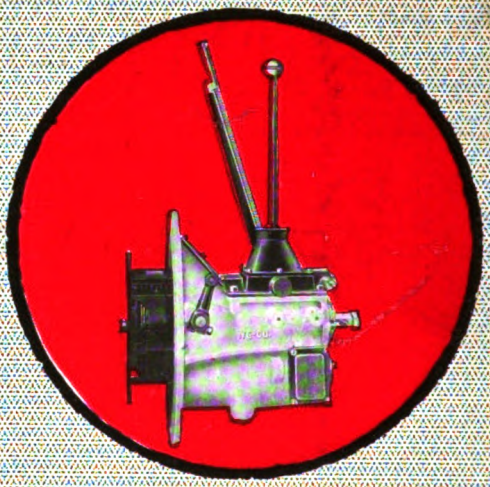

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Transmissions Steering Gears
Clutches Differentials

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are guaranteed for uniformity and real service.

Car makers will increase prestige through the use of our

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Included are RUSCO Specialties for Ford Cars,
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Automobile Brake Lining

We offer no extravagant claims, just good honest brake lining—lining that has satisfied users everywhere.

We Shall Be Glad to Quote Prices

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A-B-C Business is *Always* Profitable

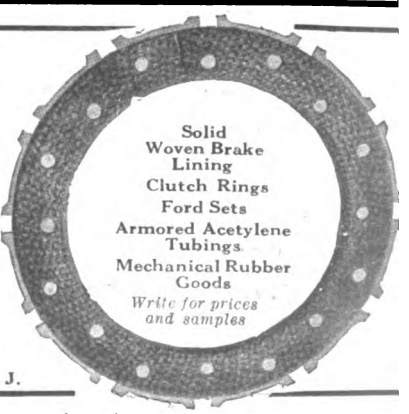
Dealers find A-B-C Brake Lining a most profitable seller, because their customers *demand* the safety and economy it insures. It is *guaranteed* as to durability, gripping power, and immunity from heat, oil, water, greases and gasoline.

In the same quality class are *A-B-C* Sheet Packings, *A-B-C* Radiator Hose and *A-B-C* Fabric Fan Belts.

These products cannot be affected by chemical action, and will give long and constant service.

Write for discounts and full details.

American Brake-Lining Co., Lansdale, Pa.



WOVEN STEEL HOSE & RUBBER CO. Trenton, N. J.

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LINING, Brake, for Fords

(For lining brake bands and transmission bands)

A-B-C—See American Brake-Lining Co.

Advance Automobile Accessories Corp., Dept. K10-1, 56 E. Randolph St., Chicago, Ill. (See page 423.)

American Asbestos Co., 1219 Stanbridge St., Norristown, Pa. "Testbestos." (See page 415.)

American Brake-Lining Co., Lansdale, Pa. "A-B-C," "Wales." (See page 415.)

Appleby & Co., T. H., 107 N. Franklin St., Syracuse, N. Y.

Asbestos & Rubber Works of America, 1790 Broadway, New York, N. Y. "Motobestos." (See page 425.)

Auto Equipment Co. (Roxborough), Philadelphia, Pa. "Perfection."

Axwell Equipment Co., 214 Wood St., Pittsburgh, Pa.

Bond Co., Charles, 520 Arch St., Philadelphia, Pa. "Fabritex."

Dependon Auto Specialty Co., 1408-10 Michigan Ave., Chicago, Ill. "Triplex."

Empire Weaving & Belting Corp. (East Rochester), Rochester, N. Y.

Evergood—See Grossman Mfg. Corp.

Fabritex—See Bond Co.

Federal Asbestos Co., Van Houton St., Paterson, N. J. "Fordbestos."

Ford Mfg. Co., Howard, Coldwater, Mich.

Fordbestos—See Federal Asbestos Co.

Garco—See General Asbestos & Rubber Co.

General Asbestos & Rubber Co., Charleston, S. C. "Garco." (See Back Cover.)

Grossman Mfg. Corp., Emil, Bush Terminal Bldg. No. 20, Brooklyn, N. Y. "Evergood."

Howe Mfg. Co., Chicago, Ill. "Kork Tred."

J-M Non-Burn—See Johns-Manville Co.

Johns-Manville Co., H. W., Madison Ave. & 41st St., New York, N. Y. "J-M Non-Burn."

Kork Tred—See Howe Mfg. Co.

Longwear—See Wearwell Gasket & Packing Co.

Motobestos—See Asbestos & Rubber Works of America.

Perfection—See Auto Equipment Co.

Powers Mfg. Co., 1340 Sycamore St., Waterloo, Ia.

Raybestos Co., Bridgeport, Conn. (See page 341.)

Right Motor Specialties Co., 1326 Michigan Ave., Chicago, Ill. "Sure-Hold."

Rusco—See Russell Mfg. Co.

Russell Mfg. Co., Middletown, Conn. "Rusco." (See page 415.)

Scandinavia Belting Co., 106 Reade St., New York, N. Y.

Standard Brake Lining Co., Gleasondale, Mass.

Staybestos Mfg. Co., 5534 Lena St. (Germantown), Philadelphia, Pa. "Universal."

Sure-Hold—See Right Motor Specialties Co.

Testbestos—See American Asbestos Co.

Thermoid Rubber Co., Trenton, N. J. (See pages 373 and 397.)

Triplex—See Detroit Auto Specialty Co.

Universal—See Staybestos Mfg. Co.

Wales—See American Brake-Lining Co.

Wearwell Gasket & Packing Co., Camden, N. J. "Longwear." (See page 501.)

Woven Steel Hose & Rubber Co., Trenton, N. J. (See page 415.)

LINING CUTTERS—See Cutters, Brake Banding

LINING, FRAME—See Lining, Body or Frame

LINING, TRANSMISSION BAND, FOR FORDS—See Lining, Brake

LINKS, STEERING—See Connections, Steering

LINKS, Steering, for Fords

Cincinnati Ball Crank Co., (Oakley), Cincinnati, O. (See page 353.)

LINKS, Tire Chain Repair

Stolp Co.—See Zinke Co.

Zinke Co., 1323-25 Michigan Ave., Chicago, Ill. (Sole Distributors for Stolp Co., Chicago, Ill.)

LINOLEUM

(For covering Floor and Running Boards)

American Linoleum Mfg. Co., 366 Fifth Ave., New York, N. Y. "Wild's."

Armstrong Cork Co., 133 23d St., Pittsburgh, Pa.

Blabon Co., Geo. W., 21st St. & Hunting Park Ave., Philadelphia, Pa.

Cook's Linoleum Co., E. State St., Trenton, N. J.

Lin-Rhuber—See Sloane, W. & J.

Nairn Linoleum Co.—See Sloane, W. & J.

Potter, Sons & Co., Thomas, Second & Erie Sts., Philadelphia, Pa.

Ringwalt Linoleum Works, 230 Fifth Ave., New York, N. Y.

Sloane, W. & J., 573 Fifth Ave., New York, N. Y. (Sole Distributors for Nairn Linoleum Co., Newark, N. J.) "Lin-Rhuber." (See page 417.)

Wild's—See American Linoleum Mfg. Co.

LINOLEUM CEMENT—See Cement, Linoleum

Linoleum Cleaning Compounds—See Compounds, Linoleum Cleaning.

LIQUID GLUE, AEROPLANE—See Glue, Aeroplane Liquid

LOAD INDICATING METERS—See Meters, Truck Load Indicating

LOADERS, Grease Gun

Colson, H. H., 3225 Dickens Ave., Chicago, Ill. "Handy."

Handy—See Colson, H. H.

LOADERS, Truck

Galion Iron Works & Mfg. Co., Public Sq., Galion, O.

Haiss Mfg. Co., George, 138th St., & Canal Pl., New York, N. Y.

Lee Loader & Body Co., 2343 S. La Salle St., Chicago, Ill.

Link-Belt Co., 732 Dime Bank Bldg., Detroit, Mich. (See page 171.)

LOCATOR LIGHTS—See Lights, Car Locator

LOCK NUTS—See Nuts, Lock

LOCK SWITCHES—See Switches, Lock

LOCK SWITCHES FOR FORDS — See Locks, Switch and Coil

LOCK VALVES—See Valves, Gasoline Lock

LOCK WASHERS—See Nuts and Washers, Lock

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NAIRN LINOLEUMS

Nairn plain color linoleums make the most satisfactory surface for floors and running boards of

Automobiles

also the cabins and decks of

Motor Boats

Many of the leading automobile manufacturers and boat builders of the United States have been specifying Nairn Linoleums for year after year in preference to any other make or type of floor covering. Nairn is built to give longest wear.

THE NAIRN LINOLEUM COMPANY
Newark, N. J.

W. & J. Sloane

Sole Selling Agents

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New York

216-18 Sutter St.
San Francisco

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LOCKERS, Metal Clothes

Allsteelequip Co., 150 Stone Ave., Aurora, Ill.
Buffalo Wire Works Co., 431 Terrace, Buffalo, N. Y.
Clark Co., W. J., 190 Depot St., Salem, O.
Clinton Wire Cloth Co., Clinton, Mass.
Darby & Sons Co., Edward, 235 Arch St., Philadelphia, Pa.
Dexter Metal Mfg. Co., Front & Arch Sts., Camden, N. J.
Durand-Steel Locker Co., 76 W. Monroe St., Chicago, Ill.
Federal Steel Fixture Co., 4545 W. Homer St., Chicago, Ill.
Hart & Hutchinson Co., New Britain, Conn.
Hetts Co., Detroit, Mich.
Jefferis Co., R. W., 11th & Linden Sts., Camden, N. J.
Lyon Metallic Mfg. Co., Aurora, Ill.
Manufacturing, Equipment & Engineering Co., 136 Federal St., Boston, Mass.
Shults & Co., H. H., 24 Commercial St., Gowanda, N. Y.
Smith Wire & Iron Works, F. P., 54-56 W. Lake St., Chicago, Ill.
Terrell's Equipment Co., Victoria & Will Sts., Grand Rapids, Mich.
Van Dorn Iron Works Co., 2685 E. 79th St., Cleveland, O.

LOCKS, Automobile

(To prevent theft of cars; for Lock Switches—See Switches, Electric Lock; for Lock Valves—See Valves, Gasoline; for Car Door Locks—See Locks, Car Door)

A. B. & B. Specialty Co., 3300-02 Fond du Lac Ave., Milwaukee, Wis.
Autoloc—See Slaymaker Lock Mfg. Corp.
B & E Lock Co., 3522 Sixth Ave., Des Moines, Ia.
Backus Novelty Co., 901 Water St., Smethport, Pa.
Benefield—See Security Automobile Lock Co.
Broderick & Bascom Rope Co., 817 N. Second St., St. Louis, Mo. "Powersteel Autowlock."
Cairwold Mfg. Co., Third & Huntingdon Sts., Philadelphia, Pa. "Snap-on."
Christie Lock Co., 321 E. 33rd St., Chicago, Ill.
Connecticut Telephone & Electric Co., Meriden, Conn. (See pages 676 and 677.)
F. O. B. Mfg. Co., Real Estate Trust Bldg., Philadelphia, Pa. (See page 491.)
Elka Mfg. Co.—See Zinke Co.
Fold & Lock Steering Wheel Co., 1600 St. Paul St., Denver, Colo.
General Utility Co., 1326-30 Ogden St., Philadelphia, Pa. "Parker."
Goodrich-Lenhart Mfg. Co., 429 Widener Bldg., Philadelphia, Pa. (See page 111.)
Gray Lock Co., 2604 Ninth Ave., Oakland, Cal.
Guardian—See Mechanical Products Co.
H. R. Mfg. Co., 1926 S. Wabash Ave., Chicago, Ill. "Neutralock."
Handee—See Racine Handy Mfg. Co.
Husted Mfg. Co., 201 W. Bordman St., Youngstown, O.
Jensen, George C., 258 First St., San Francisco, Cal. (See page 621.)
Johnson Automobile Lock Co., 2309-15 Archer Ave., Chicago, Ill.
K & S Auto Heater & Lock Co., 3357 S. Michigan Ave., Chicago, Ill. (See page 663.)
Kwik-lok—See Michigan Tire & Accessories Co.
Mechanical Products Co., Citizens Bldg., Cleveland, O. "Guardian."
Michigan Tire & Accessories Co., 218 Michigan St., N. W., Grand Rapids, Mich. "Kwiklok."
Miller-Chapman Co., 1047 W. 16th St., Los Angeles, Cal.
Monarch Auto Lock Co., 361 Market St., Kenosha, Wis. (See page 419.)
Neutralock—See H. R. Mfg. Co.
New York Coil Co., 338-40 Pearl St., New York, N. Y. "Protector."
North Side Buick Sales Co., 918-26 Sheridan Rd., Chicago, Ill.
Nugo Device Corp., 323 W. 11th St., New York, N. Y. "Nulock."
Nulock—See Nugo Device Corp.
Parker—See General Utility Co.
Parkin—See Whitehead & Co.
Perry Auto Lock Co., 2210-14 Michigan Ave., Chicago, Ill. (See page 419.)
Powersteel Autowlock—See Broderick & Bascom Rope Co.
Protector—See New York Coil Co.
Racine Handy Mfg. Co., 107 Fifth St., Racine, Wis. "Handee."
Reliance Co., 411-17 S. Sangamon St., Chicago, Ill. (See page 521.)
Robe Lock Co., 1853 38th Ave., Oakland, Cal.
Rochester Safety Lock Co., 530 Main St., Rochester, Ind.
Safety Auto Lock Co., Widener Bldg., Philadelphia, Pa.
Sargent & Greenleaf, 178 Court St., Rochester, N. Y.
Security Automobile Lock Co., 2106 Boulevard Pl., Indianapolis, Ind. "Benefield."
Slaymaker Lock Mfg. Corp., 803-70 First St., Lancaster, Pa. "Autoloc."
Snap-On—See Cairwold Mfg. Co.
Western Atlantic Engineering Co., 35 W. 32d St., New York, N. Y.
Whitehead & Co., W. S., Commercial Trust Bldg., Philadelphia, Pa. "Parkin."
Zinke Co., 1323-25 Michigan Ave., Chicago, Ill. (Sole Distributors for Elka Mfg. Co., San Francisco, Cal.)

LOCKS, BOX—See Locks, Cabinet

LOCKS, Cabinet and Pad

American Keyless Lock Co., 628 W. Jackson Blvd., Chicago, Ill.
Chicago Cabinet Lock Co., Lakeview, Chicago, Ill. (See page 419.)
Corbin Cabinet Lock Co., New Britain, Conn.
Eagle Lock Co., Terryville, Conn.
Fraim Lock Co., E. T., Park Ave. & Jefferson St., Lancaster, Pa.
Junkunc Bros., 76th & Wallace Sts., Chicago, Ill.
King Lock Co., 319 W. Ohio St., Chicago, Ill. (See page 421.)
Sargent & Co., Water & Wallace Sts., New Haven, Conn.
Slaymaker Lock Mfg. Corp., 808-70 First St., Lancaster, Pa.
Yale & Towne Mfg. Co., 9 E. 40th St., New York, N. Y. (See page 419.)

LOCKS, Car Door

Aetna Brass Mfg. Co., 1633 E. 55th St., Cleveland, O.
American Brass Novelty Co., Grand Haven, Mich.
Chicago Cabinet Lock Co., Lake View, Chicago, Ill. (See page 419.)
Cowles & Co., C., New Haven, Conn. (See page 339.)
Douglas & Lomason Co., 642 Lincoln Ave., Detroit, Mich.

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YALE

Motor Locks

for every locking need

Yale Motor Car locks are standard equipment on many cars; your car should have them for protection and security.

Specially made in various styles and sizes for securely locking coil switches, gear shift levers, tool and battery boxes, tire holders, luggage boxes, trunks, etc.

Write for descriptive circulars, etc.

The Yale & Towne Mfg. Co.
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"PERRY"

The Only Lock That Thieves Won't Touch

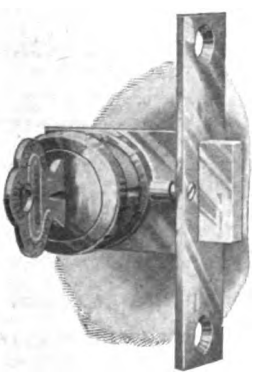
More sold since January than all other locks combined

Special (Yale) Type for Fords—$6
Write for dealer proposition

PERRY AUTO LOCK CO.
2210-14 Michigan Avenue
CHICAGO, ILL.

LOCKS

for Automobile Pillars, Handles Doors, Etc.

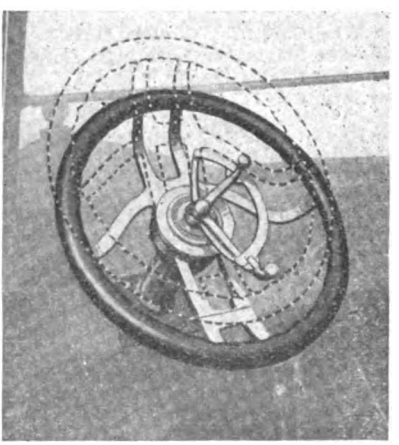


Pillar or Door Lock

Chicago Cabinet Lock Co.
Lakeview Post Office, CHICAGO, ILL.

The Monarch

The King of Auto Locks
When locked cannot be driven nor towed
Fits All Cars — Easily Attached



"Pat. Pend."
"Thieves laughed at locksmiths, but now we laugh at thieves." Dotted line shows wheel shoved up in locked position for easy entrance.
Send for literature and prices
MONARCH AUTO LOCK COMPANY
361 Market Street, Kenosha, Wis.

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LOCKS, Car Door (Continued)

Eastern Production Co., 137 Leib St., Detroit, Mich. (See page 345.)

Eberhard Mfg. Co., 2734 Tennyson Rd., Cleveland, O.

English & Mersick Co., New Haven, Conn. (See page 573.)

Ferro Stamping & Mfg. Co., 287-97 Franklin St., Detroit, Mich.

McKinney Mfg. Co. (N. S.), Pittsburgh, Pa.

Mitchell Specialty Co., Market & 18th Sts., Philadelphia, Pa.

Ochsner & Sons Co., A., 1060 State St., New Haven, Conn.

Parsons Mfg. Co., Detroit, Mich.

Searight-Downs Mfg. Co., 45 E. Fort St., Detroit, Mich.

Smith & Co., Jos. N., E. Grand Blvd. & Dubois St., Detroit, Mich.

Variety Mfg. Co., 2958 Carroll Ave., Chicago, Ill.

Woodruff & Sons Co., Walter W., Mount Carmel, Conn.

LOCKS, CRANK, FOR FORDS—See Locks, Starting Crank

LOCKS, NUT—See Nuts, Lock

LOCKS, Pedal, for Fords

(For locking clutch pedal in neutral or brake pedal in on position)

Bee-Kay Motor Lock Co., Atlanta, Ga.

Eureka Parts Co., 328 Central Ave., Dunkirk, N. Y.

Lee Hardware Co., Salina, Kans.

LOCKS, Spark and Throttle Lever, for Fords

(For locking spark and throttle levers in fully advanced or retarded position)

Adams, Alden L., 18 Ormond St., Springfield, Mass.

B. & E. Lock Co., 3522 Sixth Ave., Des Moines, Ia.

Backus Novelty Co., 901 Water St., Smethport, Pa.

Clinton Wire Cloth Co., Clinton, Mass.

Fordloc—See Slaymaker Lock Mfg. Corp.

Handee—See Racine Handy Mfg. Co.

Koehler Mfg. Co., 1424 Chestnut St., St. Louis, Mo.

Racine Handy Mfg. Co., 107 Fifth St., Racine, Wis. "Handee."

Slaymaker Lock Mfg. Corp., 303-70 First St., Lancaster, Pa. "Fordloc."

Sturr Auto Lock Co., 9 View Pl. (Mt. Auburn), Cincinnati, O.

LOCKS, Starting Crank, for Fords

(For locking starting crank in such a position that it can not be engaged or used)

Bridges—See Cochran Pipe Wrench Mfg. Co.

Cochran Pipe Wrench Mfg. Co., 7544 S. Chicago Ave., Chicago, Ill. "Bridges."

Handee—See Racine Handy Mfg. Co.

Kranklock—See Oakes Co.

Metal Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

Nelson Mfg. Co., A., 2700 Southport Ave., Chicago, Ill.

Oakes Co., Indianapolis, Ind. "Kranklock." (See page 279.)

Racine Handy Mfg. Co., 107 Fifth St., Racine, Wis. "Handee."

LOCKS, Steering Gear, for Fords

(For locking steering gear or steering wheel in a manner to prevent the turning of front wheels or steering of car)

A-Y—See Angsten-Kox Co.

Angsten-Kox Co., 5025 S. State St., Chicago, Ill. "A-Y."

De Tamble Mfg. Co., 1607-11 Prairie Ave., Chicago, Ill. "Detco."

Detco—See De Tamble Mfg. Co.

Fold & Lock Steering Wheel Co., 1600 St. Paul St., Denver, Colo.

Goodrich-Lenhart Mfg. Co., 429 Widener Bldg., Philadelphia, Pa. (See page 111.)

Metal Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

Mudd Auto Lock Co., 118-24 S. Clinton St., Chicago, Ill. "Rajo."

Mueller—See Reliance Co.

Neville Steering Wheel & Mfg. Co., Detroit, Mich. (See page 761.)

Perry Auto Lock Co., 2210-14 Michigan Ave., Chicago, Ill. (See page 419.)

Rajo—See Mudd Auto Lock Co.

Reliance Co., 411-17 S. Sangamon St., Chicago, Ill. "Safeguard." "Mueller." (See page 521.)

Safegard—See Reliance Co.

Security Auto Lock Co., 410 N. Paulina St., Chicago, Ill.

U. S. Auto Lock Co., 3845 Wabash Ave., Chicago, Ill.

LOCKS, SWITCH—See Switches, Electric Lock

LOCKS, Switch and Coil, for Fords

(Lock for Ignition Switches and Coil Boxes to prevent unauthorized use of car)

Autolock—See K-W Ignition Co.

Christie Lock Co., 321 E. 33d St., Chicago, Ill.

Cleveland Accessories Co., 705 St. Clair Ave., N. W., Cleveland, O.

Cox Mfg. Co., 3415 Perkins Ave., Cleveland, O. (See page 421.)

Cumming-Forstner Corp., 220 S. State St., Chicago, Ill. "Walker Ke-Les."

Defender Auto Lock Co., Detroit, Mich. (See page 421.)

Elka Mfg. Co.—See Zinke Co.

Goodrich-Lenhart Mfg. Co., 429 Widener Bldg., Philadelphia, Pa. (See page 111.)

Hall Hardware Co., 137-39 W. Washington St., Indianapolis, Ind. "Neal."

K-W Ignition Co., 2900 Chester Ave., Cleveland, O., "Autolock." (See page 449.)

Marvel Accessories Mfg. Co., 2011 E. 46th St., Cleveland, O. (See page 763.)

Neal—See Hall Hardware Co.

New York Coil Co., 338-40 Pearl St., New York, N. Y. "Security."

Sandell Switch Lock Co., 190 Pearl St., Hartford, Conn.

Security—See New York Coil Co.

Star Specialty Mfg. Co., 227-33 W. Erie St., Chicago, Ill.

Syracuse Universal Mfg. Co., 325-27 W. Fayette St., Syracuse, N. Y.

Temco Electric Motor Co., Leipsic, O.

Walker Ke-Les—See Cumming-Forstner Corp.

Zinke Co., 1323-25 Michigan Ave., Chicago, Ill. (Sole Distributors for Elka Mfg. Co., San Francisco, Cal.)

LOCKS, THROTTLE LEVER, FOR FORDS —See Locks, Spark and Throttle Lever

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Blacolock Type P. B.

Blacolock Your Car!

Put an end to thieving with the simplest and most practical protective method of car locking, the

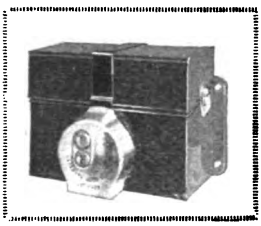
Blacolock Ignition Control

Yale Key operates circuits. No secondary operation necessary. We make a type for every ignition. Type P.B. controls both lights and ignition.

Dealers, manufacturers and owners will be sent descriptive literature and prices on request.

COX MANUFACTURING CO., Successors to

Blackburn Specialty Co. 3415 Perkins Ave., Cleveland, O.



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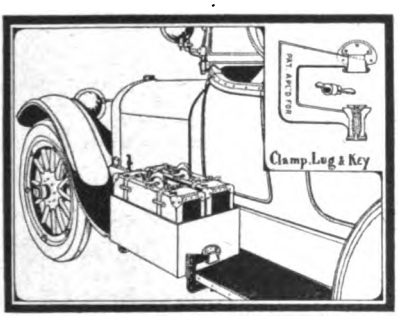

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The "BLAKE CLAMPLOCK"

is a new device which, without boring of holes on the running board or marring the car's finish, will securely fasten and automatically lock a trunk or box to the car. On or off in a moment.

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LOGS, Motor Boat Shaft

List Mfg. Co., E. J., Havana, Ill.

LOOPS, Brass Snap and Strap

(See also Fittings, Top)

Anchor—See North & Judd Mfg. Co.

Attwood Brass Works, Grand Rapids, Mich. (See page 531.)

Cowles & Co., C., New Haven, Conn. (See page 339.)

Desoco—See Detroit Socket Co.

Detroit Socket Co., 814 Jefferson Ave., W., Detroit, Mich. "Desoco."

Douglas & Lomason Co., 642 Lincoln Ave., Detroit, Mich.

Eberhard Mfg. Co., 2734 Tennyson Rd., Cleveland, O.

Jonah & George, Merrimac, Mass.

Metal Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

North & Judd Mfg. Co., New Britain, Conn. "Anchor." (See page 521.)

O'Brien Mfg. Co., Joseph F., 391 Broadway, New York, N. Y.

Smith & Co., Jos. N., E. Grand Blvd. & Dubois St., Detroit, Mich.

Western Brass Mfg. Works, Marshall Blvd., 21st St. & C., B. & Q. R. R., Chicago, Ill.

Woodruff & Sons Co., Walter W., Mount Carmel, Conn.

LOOSENERS, TIRE—See Tools, Tire

LOUVRE FORMING MACHINES—See Machines, Louvre Forming

LOW SPEED PEDAL LATCHES FOR FORDS—See Latches, Low Speed Pedal

LOW WATER ALARMS—See Columns, Water

LOWERING FITTINGS FOR FORDS—See Fittings, Car Lowering

LUBRICANTS, Cutting

Acme—See Cataract Refining & Mfg. Co.

Ajax—See Phoenix Oil Co.

American Oil Products Co., 1426 Seneca St., Buffalo, N. Y. "Lardo."

Cascade—See Cataract Refining & Mfg. Co.

Cataract Refining & Mfg. Co., Marine Nat'l Bank Bldg., Buffalo, N. Y. "Mystic," "Acme," "Cascade."

Cincinnati Oil Works Co., 525 Eggleston Ave., Cincinnati, O.

Connecticut Oil Co., 549 S. Leonard St., Waterbury, Conn.

Cut-Rite—See Phoenix Oil Co.

Drilline—See Krembs & Co.

Eastern Oil Co., 822 Champlain Ave., Cleveland, O.

Faultless—See Hawkeye Oil Co.

Fileine—See Houghton & Co.

Foote, Pierson & Co., 160-62 Duane St., New York, N. Y. "Lubria."

Hawkeye Oil Co., Miles & Roosevelt Sts., Waterloo, Ia. "Faultless."

Haws, Geo. A., 135 Front St., New York, N. Y. "Panhard."

Houghtolard—See Houghton & Co.

Houghton & Co., E. F., 240 W. Somerset St., Philadelphia, Pa. "Fileine," "Houghtolard."

Krembs & Co., 173 N. Green St., Chicago, Ill. "Drilline."

Larcul—See Swan & Finch Co.

Lardo—See American Oil Products Co.

Lubria—See Foote, Pierson & Co.

Mystic—See Cataract Refining & Mfg. Co.

Naglene—See Ulco Oil Co.

Oakite—See Oakley Chemical Co.

Oakley Chemical Co., 22 Thames St., New York, N. Y. "Oakite."

Panhard—See Haws, Geo. A.

Penn Petroleum & Supply Co., 115-17 N. Second St., Philadelphia, Pa.

Phoenix Oil Co., 2554 W. Fifth St., Cleveland, O. "Ajax," "Cut-rite."

Sullivan Oil Co., 413 Wells St., Chicago, Ill.

Swan & Finch Co., 165 Broadway, New York, N. Y. "Larcul."

Ulco Oil Co., Hale St. & G. T. R. R., Detroit, Mich. "Naglene."

Waverly Oil Works Co., Pittsburgh, Pa. (See page 479.)

LUBRICATING OILS—See Oils, Lubricating

LUBRICATING SPRING STRIPS — See Strips, Spring Leaf Lubricating

LUBRICATOR BELTS—See Belts, Endless Fabric; also Belts, Spiral Wire

LUBRICATOR WICKING—See Wicking, Felt Lubricator

LUBRICATORS, BOLT—See Lubricators, Spring and Shackle Bolt

LUBRICATORS, Cup Cylinder

(For feeding Graphite to cylinders)

Woolf Graphite Lubricator Co., 3024 Ames Ave., Omaha, Neb.

LUBRICATORS, Motor Boat Force Feed

American Injector Co., 175 14th Ave., Detroit, Mich. "Explo," "Surefeed."

Explo—See American Injector Co.

McCord Mfg. Co., Detroit, Mich. (See pages 558 and 559.)

Manzel Bros. Co., 320 Babcock St., Buffalo, N. Y.

Pedersen Lubricator Co., 636 First Ave., New York, N. Y.

Surefeed—See American Injector Co.

LUBRICATORS, Motor Boat Gravity

Pedersen Lubricator Co., 636 First Ave., New York, N. Y.

LUBRICATORS, OIL AND GREASE CUP—See Cups, Oil and Grease

LUBRICATORS, Pressure

(Operated by exhaust pressure)

Essex Brass Co., G. B., 480-86 Franklin St., Detroit, Mich.

Pedersen Lubricator Co., 636 First Ave., New York, N. Y.

W. H. Oil Saving Co., Lewiston, Idaho.

Wilkinson Co., Wm. H., West Medway, Mass.

LUBRICATORS, SHACKLE BOLT—See Lubricators, Spring and Shackle Bolt

LUBRICATORS, SPRING LEAF—See Cups, Spring Leaf; also Strips, Spring Leaf Lubricating

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The success of Cork Insert has brought forth inferior imitations.

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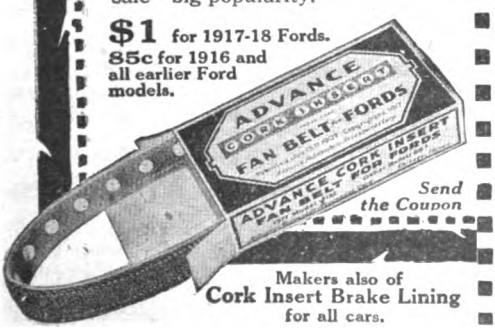
The Cork Insert line is *the line* of big merit — big advertising — big sale—big popularity.

$1 for 1917-18 Fords.
85c for 1916 and all earlier Ford models.



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LUBRICATORS, Spring and Shackle Bolt

(See Cups, Oil and Grease; also Bolts, Spring and Shackle)

Meckel Lubricator Co., 1507 Grace Ave. (Lakewood), Cleveland, O.

LUBRICATORS, Tractor Force Feed

American Injector Co., 175 14th Ave., Detroit, Mich. "Explo," "Surefeed."

Explo—See American Injector Co.

McCord Mfg. Co., Detroit, Mich. (See pages 558 and 559.)

Manzel Bros. Co., 320 Babcock St., Buffalo, N. Y.

Surefeed—See American Injector Co.

LUBRICATORS or OIL PUMPS, Hand

(Auxiliary Hand Oil Pumps)

Cox Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y.

Essex Brass Co., G. B., 480-86 Franklin St., Detroit, Mich.

Imperial Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill. (See page 733.)

Lunkenheimer Co., Beekman & Waverly Sts., Cincinnati, O.

LUBRICATORS or OIL PUMPS, Mechanical

(Engine driven Oil Pumps)

Commonwealth Brass Corp., Commonwealth Ave. & Grand Trunk Ry., Detroit, Mich.

Detroit Lubricator Co., Trumbull & Grand Trunk R. R., Detroit, Mich.

Hancock Mfg. Co., 770 Henry St., Charlotte, Mich.

Lee Co., Wm. O., Port Huron, Mich.

Lipman Refrigerator-Car & Mfg. Co., 206 Pleasant St., Beloit, Wis.

Lunkenheimer Co., Beekman & Waverly Sts., Cincinnati, O.

McCord Mfg. Co., Detroit, Mich. (See pages 558 and 559.)

Manzel Bros. Co., 320 Babcock St., Buffalo, N. Y.

Neely Mfg. Co., 829 Wells St., Chicago, Ill.

Pedersen Lubricator Co., 636 First Ave., New York, N. Y.

Pickering Governor Co., Portland, Conn.

Richardson-Phenix Co., 122-28 Reservoir Ave., Milwaukee, Wis.

Schirmer Co., 7319 W. Madison St., Cleveland, O.

Weiss, L. T., 286 Taaffe Pl., Brooklyn, N. Y.

LUBRICATORS and OIL PUMPS, for Fords

(Supplementary oiling devices)

Brown Co., 213 Bellevue Ave., Syracuse, N. Y.

Forgear Pump Co., 523 Hobart St., Oakland, Cal.

Gravity Carburetor Co., 3701 Perkins Ave., Cleveland, O.

Junior—See Pedersen Lubricator Co.

Martens Co., E. A., Ninth & Main Sts., Lafayette, Ind.

Pedersen Lubricator Co., 636 First Ave., New York, N. Y. "Junior."

Perkins Mfg. Co., Des Moines, Ia. "Strong."

Strong—See Perkins Mfg. Co.

LUGGAGE CARRIERS—See Holders, Suit Case; also Racks, Trunk; also Trunks; also Carriers, Motorcycle Luggage

LUGGAGE CASES FOR FORDS—See Bags, Luggage

LUGGAGE HOLDERS—See Holders, Suitcase or Luggage

LUGS, Tire

(For holding pneumatic tires on wheels not equipped with detachable or demountable rims)

Clark-Cadle-Harmon Corp., 1139 University Ave., Rochester, N. Y.

LUGS, Tractor Detachable

Loxon—See Universal Lug Co.

Universal Lug Co., 1401 S. 55th Ct., Cicero, Ill. "Loxon."

LUGS, Transmission Band, for Fords

Metal Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

LUMBER, Aeroplane

Astoria Veneer Mills & Dock Co., 347 Madison Ave., New York, N. Y.

Ceila—See De Polo, Oscar A.

Central Timber Export Co., 15 William St., New York, N. Y.

De Polo, Oscar A., 29 Broadway, New York, N. Y. "Ceila."

Hoffman Bros. Co., 800 W. Main St., Fort Wayne, Ind.

Kneeland-Bigelow Co., 19th & Water Sts., Bay City, Mich.

Ludlow, Israel, 233 Broadway, New York, N. Y.

Sheip & Vandegrift, 814-32 N. Lawrence St., Reading, Pa.

Thompson & Co., Lewis, Astoria, N. Y.

LUMBER, Automobile

Agasote—See Pantasote Co.

American Column & Lumber Co., St. Albans, W. Va.

Anderson-Tully Co., Memphis, Tenn.

Baker Lumber Co., Turrell, Ark.

Carrier Lumber Co., Brevard, N. C.

Carrier Lumber & Mfg. Co., Sardis, Miss.

Darling Lumber Co., J. W., Cincinnati, O.

Evans Lumber Co., G. H., Chattanooga, Tenn.

Himmelberger-Harrison Lumber Co., Cape Girardeau, Mo.

Hoffman Bros. Co., 800 W. Main St., Fort Wayne, Ind.

Interstate Lumber Co., The Arcade, Cleveland, O.

Korn-Conkling Co., Cincinnati, O.

Lamb-Fish Lumber Co., Charleston, Miss.

Leonard, H. R., Seaboard Bank Bldg., Norfolk, Va.

Love, Boyd & Co., ft. S. Second St., Nashville, Tenn.

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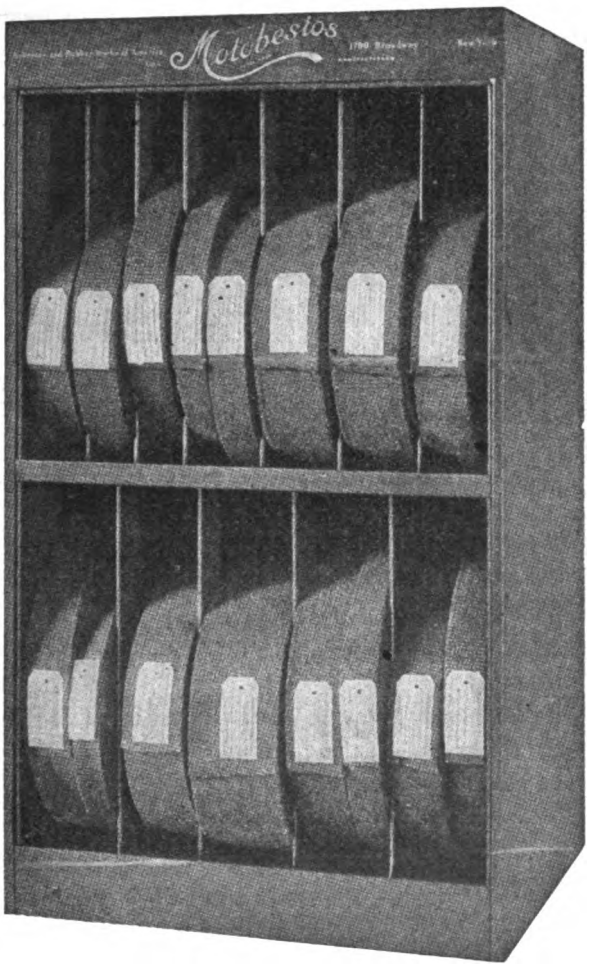
Asbestos and Rubber Works of America



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LUMBER, Automobile (Continued)

Luehrmann Hardwood Lumber Co., Chas. F., 148 Carroll St., St. Louis, Mo.

Martin-Barriss Co., 2048 W. Third St., Cleveland, O.

Moore & McFerren, Memphis, Tenn.

Mundhenk-Curtiss Lumber & Fuel Co., 27 W. Van Buren St., Chicago, Ill.

North Vernon Lumber Co., Louisville, Ky.

Paepcke-Leicht Lumber Co., 111 W. Washington St., Chicago, Ill.

Pantasote Co., 11 Broadway, New York, N. Y. "Vehisote," "Agasote."

Peitch Co., F. T., 803 Superior Ave., W., Cleveland, O.

Riel-Kadel Lumber Co. (S. Memphis), Memphis, Tenn.

Shafer, Cyrus C., Citizens National Bank Bldg., South Bend, Ind.

Sheip & Vandegrift, 818-32 N. Lawrence St., Philadelphia, Pa.

Shiels & Co., Charles F., McLean Ave. & Gest St., Cincinnati, O.

Sullivan & Co., T., Niagara & Arthur Sts., Buffalo, N. Y.

Taussig, L. J., Commercial Bldg., St. Louis, Mo.

Three States Lumber Co., Memphis, Tenn.

Vehisote—See Pantasote Co.

West Virginia Timber Co., Charleston, W. Va.

Young Lumber Co., 19 Edward St., Binghamton, N. Y.

LUMINOUS COMPOUNDS—See Paints, Luminous

LUMINOUS DIALS—See Dials, Luminous

LUMINOUS PAINTS—See Paints, Luminous

LUNCH BOXES—See Hampers, Touring

LUNCH TABLES—See Tables, Picnic and Lunch

LUNCHEON CASES—See Hampers, Touring

MACHINE BOLTS—See Bolts, Machine

MACHINE KEYS—See Keys, Machine

MACHINE SCREW TAPS—See Taps and Dies

MACHINE SCREWS—See Screws, Machine

MACHINE WORK TO ORDER

(See also Screw Machine Products)

A. B. & B. Specialty Co., 3300-02 Fond du Lac Ave., Milwaukee, Wis.

Adapt Machinery Co., 1624 S. Wabash Ave., Chicago, Ill.

Advance Machine Co., 654-58 Franklin St., Detroit, Mich.

Aetna Brass Mfg. Co., 1633 E. 55th St., Cleveland, O.

Alexander & Cox Co., Ogden & Western Aves., Chicago, Ill.

Alford Motor & Machine Co., Ninth & Lincoln Sts., Goshen, Ind.

Allen & Curtiss Co., W. Main St., Benton Harbor, Mich.

American Brass & Iron Co., Detroit, Mich. (See page 153.)

American Die & Tool Co., Reading, Pa. (See page 317.)

American Metal Products Co., 671 Kinnickinnic Ave., Milwaukee, Wis.

Ashley Machine Works, 724 University Ave., Rochester, N. Y.

Atlas Brass Foundry Co., Columbus, O. (See page 539.)

Atlas Machine Co., 31 Canal St., Waterbury, Conn.

Attwood Brass Works, Grand Rapids, Mich. (See page 531.)

Auto Engine Works, University Ave. & Griggs St., St. Paul, Minn.

Auto Engineering Co., 429-31 Bagg St., Detroit, Mich. (See page 83.)

Bailey Co., Geo. D., 4500 Ravenswood Ave., Chicago, Ill.

Baker Gun & Forging Co., Batavia, N. Y. (See page 325.)

Baum's Metal Specialties Co., 1311-13 Baltimore Ave., Kansas City, Mo.

Benton Harbor Auto Machine Co., Graham Ave., Benton Harbor, Mich.

Billings & Spencer Co., Laurel & Park Sts., Hartford, Conn.

Bilton Machine Tool Co., 990 Housatonic Ave., Bridgeport, Conn.

Black & Decker Mfg. Co., 119 Hollingsworth St., Baltimore, Md. (See page 323.)

Blair Tool & Machine Works, 521 Greenwich St., New York, N. Y.

Blake & Johnson Co., Waterbury, Conn.

Blanchard Machine Co., 64 State St., Cambridge, Mass.

Blettner Co., Geo. H., 1401-05 Jackson Blvd., Chicago, Ill.

Boeger-Meyer Machine & Tool Co., 59 McWhorter St., Newark, N. J.

Borgeson Mfg. Co., Lawrence St., Torrington, Conn.

Bourke Machine Co., 224-48 21st St., Detroit, Mich.

Bremer & Co., 139 N. Seventh St., Philadelphia, Pa.

Bridgeport Engineering Co., Bridgeport, Conn.

Bristol Machine Tool Co., 151 Riverside Ave., Bristol, Conn.

Broadway Tool & Machine Co., 717 Livingston St., Elizabeth, N. J.

Brooks Machine Co., York, Pa.

Bultman Co., F. H., 2108 Superior Viaduct, Cleveland, O.

Bunting Brass & Bronze Co., 737 Spencer St., Toledo, O. (See page 157.)

Burgess Machine Co., 140 State St., New Haven, Conn.

C. A. S. Engineering Co., 790 Woodward Ave., Detroit, Mich. (Sole Distributors for H. J. Walker Co., Cleveland, O.)

Cassady-Fairbank Mfg. Co., 6106-30 La Salle St., Chicago, Ill.

Central Brass & Fixture Co., Dept. A, Springfield, O. (See page 137.)

Chicago-Racine Aluminum, Brass & Iron Works, 224-30 W. Huron Sts., Chicago, Ill.

City Auto Repair Co., 36 Chapel St., Hartford, Conn.

Clark-Cadle-Harmon Corp., 1139 University Ave., Rochester, N. Y.

Clinton Machine Works, 460 High St., Clinton, Mass.

Commonwealth Brass Corp., Commonwealth Ave. & Grand Trunk Ry., Detroit, Mich.

Conover-Overkamp Machine & Tool Co., 841 W. Germantown St., Dayton, O.

Consolidated Machine Co., Farwell Bldg., Detroit, Mich.

Craddock, Edward S., 224-26 E. 144th St., New York, N. Y.

Crittenden Mfg. Co., Boston, Mass.

Currie & Son, J. B., 72 Adams St., Brooklyn, N. Y.

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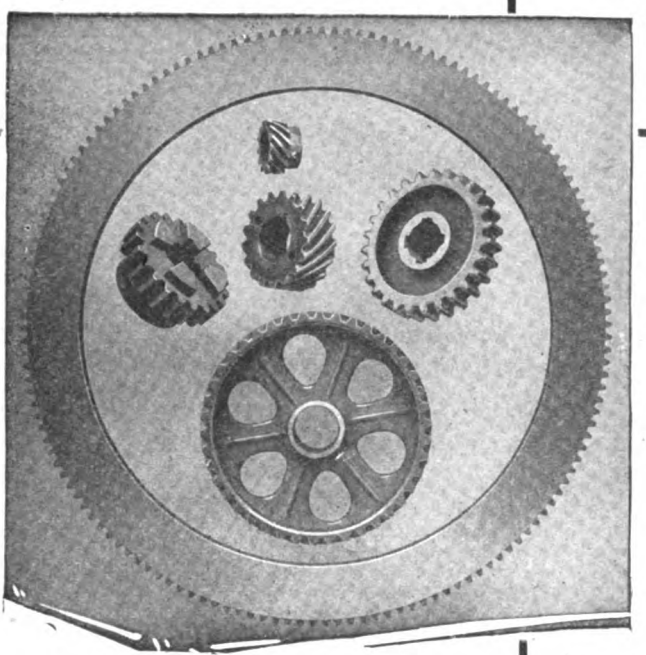
SPACKE GEARS



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MACHINE WORK TO ORDER (Continued)

Dall Motor Parts Co., Vermilion, O.

De Camp & Sloan, 172 Pennington St., Newark, N. J.

Detlaff, A. J., 121 E. Lafayette Ave., Detroit, Mich.

Detroit Gear & Machine Co., Detroit, Mich. (See page 317.)

Detroit Metal Products Co., Ford Bldg., Detroit, Mich.

Detroit Motor Casting Co., 299-302 Beaufait Ave., Detroit, Mich.

Diamond Stamping Works Co., 5400 Windsor Ave., Cleveland, O.

Dice Machine Co., 16th & Jackson Sts., Anderson, Ind.

Diebold Products Co., 5333-37 St. Clair Ave., Cleveland, O.

Ditwiler Mfg. Co., Primrose St., Galion, O.

East Iron & Machine Co., Lima, O.

Eastern Machine & Stamping Co., 15 Wickenden St., Providence, R. I.

Eastern Production Co., 136 Leib St., Detroit, Mich. (See page 345.)

Eclipse Machine Co., Elmira, N. Y. (See page 345.)

Eppenbach, Wm., 231 Vernon Ave., Long Island City, N. Y.

Eureka Tool & Machine Co., 306 Market St., Newark, N. J.

Ferro Machine & Foundry Co., 47 Hubbard Ave., Cleveland, O.

Fiber Barrel Machinery & Mfg. Co., Pittsburgh, Pa.

Foltz Mfg. & Supply Co., Hagerstown, Md.

Fore River Shipbuilding Corp., Quincy, Mass.

Fort Dearborn Mfg. Co., Sterling, Ill.

France Foundry & Machine Co., (N. Baltimore), Baltimore, O.

Fuller & Sons Mfg. Co., Kalamazoo, Mich. (See page 621.)

Garvin Machine Co., Spring & Varick Sts., New York, N. Y.

Geier Co., P. A., 5112 St. Clair Ave., E., Cleveland, O.

General Machine Co., 227 Eddy St., Providence, R. I.

General Machine Works, Lamour & Prospect Sts., York, Pa.

Giant Motor Co., 28 Calumet St., Newark, N. J.

Gill & Sons Forge & Machine Works, P. H., Lerraine & Otsego Sts., Brooklyn, N. Y. (See page 239.)

Globe Machine & Stamping Co., 1250 W. 76th St., Cleveland, O.

Goodspeed-Detroit Mfg. Co., 272-80 Harper Ave., Detroit, Mich.

Gotham Machine & Tool Co., 351-53 Jay St., Brooklyn, N. Y.

Grand Machine Co., 3456 S. Grand Ave., St. Louis, Mo.

Grand Tool & Machine Works, 161 Grand St., New York, N. Y.

Grant Mfg. & Machine Co., 90 Silliman Ave., Bridgeport, Conn.

Green & Son, John, 221-24 N. Market St., Hoopeston, Ill.

Gwynn Engineering Co., 100 Liberty Ave., Pittsburgh, Pa.

Harding & Co., 122 S. Michigan Ave., Chicago, Ill. (See page 261.)

Hartford Machine Screw Co., Hartford, Conn. (See page 513.)

Hawthorne Mfg. Co., 35 Spruce St., Bridgeport, Conn.

Henry, Millard & Henry Co., 1059-65 W. Market St., York, Pa.

Higginson-Gibson Mfg. Co., 74 Atlantic St., Boston, Mass.

Hiles & Co., C. A., 14th St. & Western Ave., Chicago, Ill.

Hoosier Motor Co., 612-14 E. Madison St., Goshen, Ind.

Houpert Machine Co., Harris Ave. & Main St., Long Island City, N. Y. (See page 491.)

Houser Machine & Mfg. Co., 232 Mill St., Rochester, N. Y.

Hudson-Peck Machine Products Co., Real Estate Trust Bldg., Philadelphia, Pa.

Imperial Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill. (See page 733.)

Indianapolis Tool & Mfg. Co., Indianapolis, Ind. (See page 335.)

Industrial Electric Mfg. Co., 139 Beaubien St., Detroit, Mich.

Inter-State Machine Products Co., 56 Allen St., Rochester, N. Y.

Jambor Mfg. Co., 911 Center St., Milwaukee, Wis. (See page 429.)

Johnson Bronze Co., Mill St., New Castle, Pa.

Johnson Mfg. Co., 103 N. Front St., Philadelphia, Pa.

Keeler Brass Co., 261-71 Godfrey Ave., Grand Rapids, Mich.

Kell, Hock & Co., 336-38 Mulberry St., Newark, N. J.

Kidder-Oswald Co., Dayton, O.

Knott Mfg. Co., Tell City, Ind.

Konigslow Mfg. Co., Otto E., 3701 Perkins Ave., Cleveland, O.

Krahn Mfg. Co., 588 Clinton St., Milwaukee, Wis.

Laclede Iron Works, 1315 Chestnut St., St. Louis, Mo.

Ladish Drop Forge Co., Cudahy, Wis. (See page 333.)

Langtry Machine & Tool Co., 700 Commonwealth Ave., Detroit, Mich.

Lauer Machine Co., John, 108-14 St. Antoine St., Detroit, Mich.

Lawrence & Co., L., 292 Halsey St., Newark, N. J.

Lawrie Co., Fred'k S., Odd Fellows Bldg., Indianapolis, Ind. (Sales Agents.) (See page 867.)

Lee Co., Wm. O., Port Huron, Mich.

Lewis Spring & Axle Co., 42 Hollier St., Chelsea, Mich.

Lewis-White, Syracuse, N. Y.

Liggett Spring & Axle Co., Monongahela, Pa.

Limerick Co., J. Arthur, 960 N. Howard St., Baltimore, Md.

Link-Belt Co., 732 Dime Bank Bldg., Detroit, Mich. (See page 171.)

Long Machine Works, Adam A., Ave. E & St. Paul St., Rochester, N. Y.

Lucas-Miner Pump Co., Dayton, O.

Lycoming Foundry & Machine Co., Williamsport, Pa.

McCadden Machine Works, St. Cloud, Minn.

McDougall & Potter Co., 606 W. 55th St., New York, N. Y.

McKenna Brass & Mfg. Co., First Ave. & Ross St., Pittsburgh, Pa. (See page 481.)

Mantle & Co., 1907 Park Ave., New York, N. Y.

Marf Machine Co., 438 Pearl St., New York, N. Y.

Meisel Press Mfg. Co., 945 Dorchester Ave., Boston, Mass. (See page 319.)

Metropolitan Mfg. Co., Oakman Ave. & Detroit Terminal R. R., Detroit, Mich. (See page 641.)

Milwaukee Forge & Machine Co., 340 Oklahoma Ave., Milwaukee, Wis.

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STAMPINGS
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The S. A. Machine Company is in a position to handle machine work of every kind for manufacturers of automobiles and accessories. We can fill orders in accordance with your specifications as to material, finish, delivery and price with the greatest possible dispatch. We are specialists in the production of

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MACHINE WORK TO ORDER (Continued)

Milwaukee Metal Working Co., 382-88 Clinton St., Milwaukee, Wis.
Milwaukee Separator Mfg. Co., 247 Madison St., Milwaukee, Wis.
Modern Machinery Co., Monroe & Fifth Sts., Wilmington, Del.
Morgan Mfg. Co., Keene, N. H.
Motor Engineering Co., E. 61st St. & Curtiss Ave., Cleveland, O.
Motor Parts Machine Co., 645-49 S. Pierce St., Milwaukee, Wis.
National Engineering Co., Saginaw, Mich. (See page 459.)
National Engineering Co., Liberty Bldg., Philadelphia, Pa.
National Sewing Machine Co., Belvidere, Ill.
National Stamping & Electric Works, 410-26 Clinton St., Chicago, Ill.
National Vacuum Machinery Co., Shawnee & Wyandott Sts., Dayton, O.
Nelson Tool & Machine Co., 253 Norfolk St., Newark, N. J.
New Britain Machine Co., New Britain, Conn. (See page 659.)
New Haven Machine Co., New Haven, Conn.
Newark Tool & Die Co., 20-22 Lawrence St., Newark, N. J.
Nilson-Miller Co., 13th & Hudson Sts., Hoboken, N. J.
North End Tool Co., 339 Franklin Ave., Bloomfield, N. J.
Oberdorfer Brass Co., M. L., 804 E. Water St., Syracuse, N. Y.
Oswego Machine Works, 68 W. First St., Oswego, N. Y.
Otto Metal Goods Corp., Wm. H., 401-07 St. Paul's Ave., Jersey City, N. J.
Parker White Metal & Machine Co., 23rd & Railroad Sts., Erie, Pa. (See page 655.)
Parsons Mfg. Co., Detroit, Mich.
Parts Mfg. Co., 217 E. Eighth St., Cincinnati, O.
Perelstrous & Storms Tool Corp., 42 Broadway, New York, N. Y. (See page 643.)
Perfection Auto Parts Co., 404 Lakeside Ave., N. W., Cleveland, O. (See page 493.)
Peters Machine & Mfg. Co., Madison Ave. & W. 74th St., Cleveland, O.
Pfau Mfg. Co., Cincinnati, O.
Piper Machine Co., 560-70 N. Elder Ave., Indianapolis, Ind.
Portland Forge & Foundry Co., Portland, Ind.
Power, Laurence C., 712 Cherry St., Philadelphia, Pa.
Premier Mfg. Co., Sandy Hook, Conn.
Printing Machinery Co., Cincinnati, O.
Puritan Machine Co., 422 Lafayette Blvd., Detroit, Mich.
Raymond Engineering Corp., 305 Lafayette St., New York, N. Y.
Reus Bros. Co., 146 W. Mt. Royal Ave., Baltimore, Md.
Rider-Bagg Co., 369 Birnie Ave., Springfield, Mass.
Riverside Machine Co., Front & Penn Sts., Chester, Pa.
Rochester Motors Co., 634 Lexington Ave., Rochester, N. Y.
Rome Engineering Co., Rome, N. Y.
Rosbach Co., F. P., Benton Harbor, Mich.
Roseville Engineering & Machine Co., 98 13th Ave., Newark, N. J.
Ross Machine Co., 208 S. Fourth St., Lafayette, Ind.
Russ Co., W., 58th St. & Walworth Ave., Cleveland, O.
S. A. Machine Co., Detroit, Mich. (See page 429.)
"S-C" Regulator Co., Perry & High Sts., Fostoria, O.
Savage Arms Corp., Sharon, Pa. (See page 213.)
Sayre Stamping Co., Lockhart Bldg., Sayre, Pa.
Schatz Mfg. Co., 17 Fairview Ave., Poughkeepsie, N. Y.
Scientific Machine & Tool Corp., 57-59 Jay St., Brooklyn, N. Y.
Scott Electrical Co., 357 Ogden St., Newark, N. J.
Scovill Mfg. Co., Waterbury, Conn. (See page 659.)
Selik Bros., 640-48 24th St., Detroit, Mich.
Service Gear & Machine Co., Second & Buttonwood Sts., Reading, Pa.
Shields Machine Co., Whitney Power Blk., Cleveland, O.
Shimer & Sons, Samuel J., Milton, Pa.
Sier-Bath Co., 143 W. 54th St., New York, N. Y. (See page 357.)
Simmons Mfg. Co., 2327-43 E. Fourth St., Cleveland, O.
Sloan & Chace Mfg. Co., Sixth Ave. & 13th St., Newark, N. J.
Slocomb & Co., F. F., Wilmington, Del.
Smith Mfg. Co., Philip, Sidney, O.
South Park Mfg. Co., Port Huron, Mich.
Spacke Machine & Tool Co., Indianapolis, Ind. (See page 427.)
Spies Special Machine Works, 231 W. Schiller St., Chicago, Ill.
Stafford Motor Car Co., 2201-09 Campbell Ave., Kansas City, Mo.
Standard Separator Co., 45th & Burnham Sts., Milwaukee, Wis.
Star Tool & Mfg. Co., 613-15 W. 69th St., Chicago, Ill. (See page 733.)
Steger & Sons Industrial Works, Steger, Ill.
Steinbart & Wegner Automobile Machine Works, 315-17 W. 47th St., New York, N. Y.
Superior Machine Co., 809 E. Washington St., Indianapolis, Ind.
Superior Machine & Engineering Co., 51-53 Fort St., E. Detroit, Mich.
T. C. M. Mfg. Co., Hunterdon & First Sts., Harrison, N. J.
Taft-Peirce, Woonsocket, R. I. (See page 595.)
Taylor Machine Co., 7804 Carnegie Ave., Cleveland, O.
Textile Machine Works, Reading, Pa.
Torrington Mfg. Co., Torrington, Conn.
Triangle Tool Co., Eighth & Holland Sts., Erie, Pa.
Turner & Moore Mfg. Co., 32 Addison Ave., Detroit, Mich.
Tuttle & Bailey Mfg. Co., New York, N. Y.
Unger Bros., Newark, N. J.
Union Elevator & Machine Co., 227 W. Erie St., Chicago, Ill.
United Machine Works, 55-57 W. Third St., New York, N. Y.
Up-to-Date Machine Works, 2913-15 S. Wabash Ave., Chicago, Ill.
Upton Machine Co., St. Joseph, Mich.
Viking Tool & Machine Co., 75-77 13th St., Brooklyn, N. Y.
Voelkner & Harry Mfg. Co., 282-92 Woodbridge St., E. Detroit, Mich.
Vulcan Brazing & Machine Co., 1630-32 Vine St., Philadelphia, Pa.
Wade Machine Co., 817 Albany St., Boston, Mass.
Walker Co.—See C. A. S. Sales Co.
Ware Bros., 224 N. Ada St., Chicago, Ill.
Warren Machine Products Co., Warren, Pa. (See page 575.)
Wayne Works, Richmond, Ind.

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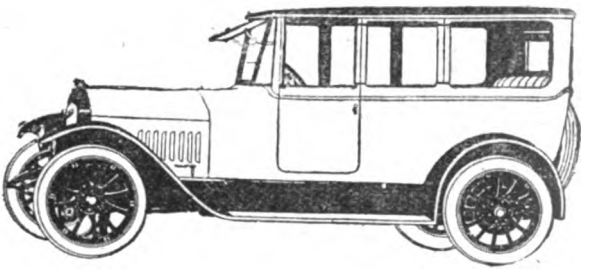

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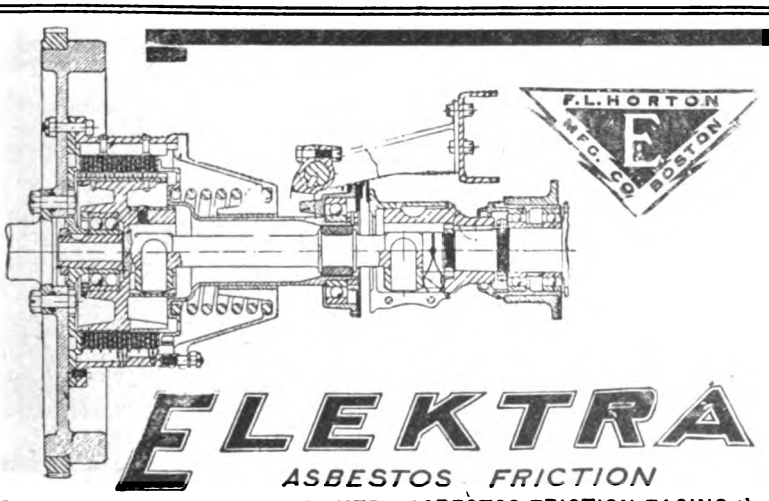

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Weber Bros. Metal Works, 108-28 N. Jefferson St., Chicago, Ill.
Weiss, L. T., 286 Taaffe Pl., Brooklyn, N. Y.
West & Dodge, 167 Oliver St., Boston, Mass.
Western Brass Mfg. Works, Marshall Blvd., 21st St. & C., B. & Q. R. R., Chicago, Ill.
Westinghouse Electric & Mfg. Co. (E. Liberty), Pittsburgh, Pa.
Wheeler & Son, Frank, 55 Stone St., Meriden, Conn.
Wilcox Motor & Mfg. Co., Saginaw, Mich. (See page 585.)
Wilsch Machine & Specialty Co., 237 Lafayette St., New York, N. Y.
Wisconsin Machinery & Mfg. Co., 51st & Burnham Sts., Milwaukee, Wis.
Wood & Spencer Co., 1930 E. 61st St., Cleveland, O.
York Electric & Machine Co., 30-34 N. Penn St., York, Pa.
Zacharias, Edwin H., 121 Washington St., Reading, Pa.
Zeifang Machine Co., 825 Linwood Ave., Niagara Falls, N. Y.
Zuhr, Henry, 200 William St., New York. N. Y.

MACHINED PISTONS—See Pistons, Finished and Machined

MACHINERY, Dealers in

(Comprising only Dealers in Machinery who advertise in this Publication)

Davis Machine Tool Co., W. F., 5-41 W. Washington Blvd., Chicago, Ill. (See page 485.)
Dunkle Co., Arthur J., 50 Church St., New York, N. Y. (See page 671.)

MACHINERY SPRINGS—See Springs, Machinery

MACHINES, AEROPLANE STRUT FORMING—See Lathes, Aeroplane Strut

MACHINES, Aircraft Propeller Blade Shaping

Curtis Machine Corp., Jamestown, N. Y.
Fay & Egan Co., J. A., 415 W. Front St., Cincinnati, O. "Lightning."
Lightning—See Fay & Egan Co.

MACHINES, Aircraft Propeller Hub Boring

Fay & Egan Co., J. A., 415 W. Front St., Cincinnati, O.

MACHINES, Aircraft Propeller Toothing

Whitney & Son, Baxter D., Winchendon, Mass. (See pages 329 and 603.)

MACHINES, Autogenous Welding

(Oxy-Acetylene Welding Apparatus)

Admiral Welding Machine Co., 1331 Walnut St., Kansas City, Mo.
American Brazing & Welding Co., 23d & Olive Sts., St. Louis, Mo.
Ashton, Laird & Co., 603-07 W. 43d St., New York, N. Y. "Astra."
Astra—See Ashton, Laird & Co.
Bermo Co., B. A., Omaha, Neb. (See page 683.)
Bird-Wilcox Co., Atlanta, Ga.
Bishop-Babcock-Becker Co., E 49th St. & Hamilton Ave., Cleveland, O.
Buckeye—See Macleod Co.
Cox Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y.
Davis-Bournonville Co., Van Wagenen Ave., Jersey City, N. J.
Dunkle Co., Arthur J., 50 Church St., New York, N. Y. (Dealers.) (See page 671.)
Dyer Co., G. H., Cambridge, Mass. (See page 505.)
Economy Welding Machine Co., 213 S. Boulevard, Kansas City, Mo.
Erie Welding Equipment Co., Mill Rd., Hamilton, O.
Evleth-Lindsay Co., St. Paul, Minn. "Torit."
Gem—See Rice & Dayton Mfg. Co.
General Welding Co., 355-57 14th St., Hoboken, N. J. "Ideal."
Hauck Mfg. Co., 140 Livingston St., Brooklyn, N. Y.
Havens Bros. Mfg. & Supply Co., 1622 Wazee St., Denver, Colo.
Henderson-Willis Welding & Cutting Co., 2826 Locust St., St. Louis, Mo.
Ideal—See General Welding Co.
Imperial Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill. (See page 733.)
Little Gem—See Rice & Dayton Mfg. Co.
MacLeod Co., 2232 Bogen St., Cincinnati, O. "Buckeye."
Manufacturers Welding Co., 740 Jamaica Ave., Brooklyn, N. Y. "U. O. C."
Metal Welding & Supply Co., 809-11 Broadway, Denver, Colo.
Metals Welding Plant, 4400 Perkins Ave., Cleveland, O. (See page 400.)
Milburn Co., Alexander, 1420 W. Baltimore St., Baltimore, Md.
Nev-O-Fail—See Turner Brass Works.
Oxweld Acetylene Co., 36th St. & Jasper Pl., Chicago, Ill.
Oxy-Carbi Co., 396 George St., New Haven, Conn.
Prest-O-Lite Co., Indianapolis, Ind. (See page 89.)
Rice & Dayton Mfg. Co., 115-19 E. Fourth St., Cedar Falls, Ia. "Gem," "Little Gem."
Russ—See Stewart, F. W.
Russ Co., W. 58th St. & Walworth Ave., Cleveland, O.
Sanford Mfg. Co., F. C., 2060 Fairfield Ave., Bridgeport, Conn.
Saylor Co., F. A., 3202-04 Chestnut St., Philadelphia, Pa.
Schaap Automobile Co., 344 Cumberland St., Brooklyn, N. Y. (See page 655.)
Schemmel Welding Machine Works, Wapakoneta, O.
Stewart, F. W., 1402-06 Michigan Ave., Chicago, Ill. "Russ."
Suffolk Casting & Supply Co., 156 Pearl St., Boston, Mass.
Superior Oxy-Acetylene Machine Co., Rentschler Bldg., Hamilton, O.
Tolman Mfg. Co., 1921 W. Third St., Boston, Mass.
Torit—See Evleth-Lindsay Co.
Turner Brass Works, Sycamore, Ill. "Nev-O-Fail."
U. O. C.—See Manufacturers Welding Co.
Universal Oxygen Co., 14th & Illinois Sts., Sheboygan, Wis.
Vulcan Brazing & Machine Co., 1630-32 Vine St., Philadelphia, Pa.
Vulcan Process Co., 2450 University Ave., S. E., Minneapolis, Minn.
Waterhouse Welding Co., 15 Pelham St., Boston, Mass.
Weldrite Co., 102 Hunter Ave., Long Island City, N. Y.

MACHINES, AUTOMATIC SCREW—See Machines, Screw

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It's a fact that few people buy a lot of wrenches at one time, and the result is a miscellaneous stock in the tool box, many sizes missing, some sizes duplicated, and other sizes for which they have no use at all.

Bolts from ¼ to ¾ in. and Cap Screws from ¼ to 1 in.; 15 sizes in all, are in common and constant use everywhere. A set of Williams' "Big 6—15" covers just this field, is neatly put up and is an economical lot of tools —all you need and no wasters.

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MACHINES, Balancing

(For Balancing Ways—See Ways, Balancing)

Carlson-Wenstrom Co., Richmond St. & Erie Ave., Philadelphia, Pa. "Carwen."

Carwen—See Carlson-Wenstrom Co.

Vibration Specialty Co., Harrison Bldg., Philadelphia, Pa.

MACHINES, BAND SAWING—See Saws, Band

MACHINES, BANDAGE WRAPPING—See Machines, Tire Bandage Wrapping

MACHINES, BEADING—See Machines, Crimping

MACHINES, Boring

(Horizontal)

Beaman & Smith Co., Gordon & Reynolds Aves., Providence, R. I.

Cleveland Machine Tool Works, 3215 Superior Ave., Cleveland, O.

Espen-Lucas Machine Works, Front & Girard Sts., Philadelphia, Pa.

Fosdick Machine Tool Co., Blue Rock & Apple Sts., Cincinnati, O.

Gisholt Machine Co., 1315 E. Washington Ave., Madison, Wis.

Lucas Machine Tool Co., E. 99th St. & L. S. & M. Ry., Cleveland, O. "Precision."

Niles-Bement-Pond Co., 111 Broadway, New York, N. Y.

Precision—See Lucas Machine Tool Co.

Universal Boring Machine Co., 20 Tower St., Hudson, Mass.

MACHINES, Boring

(Vertical)

Baker Bros., Westlake Ave. & Post St., Toledo, O.

Beaman & Smith Co., Front & Girard Sts., Providence, R. I.

Bullard Machine Tool Co., Bridgeport, Conn.

Cincinnati Planer Co., Cincinnati, O.

Colburn Machine Tool Co., Franklin, Pa.

Foote-Burt Co., 4101 St. Clair Ave., Cleveland, O.

Hoefer Mfg. Co., Chicago & Jackson Sts., Freeport, Ill.

King Machine Tool Co., Clinton Ave. & B. & O. R. R., Cincinnati, O.

Moline Tool Co., 319 20th St., Moline, Ill.

Niles-Bement-Pond Co., 111 Broadway, New York, N. Y.

MACHINES, BOW DRESSING—See Machines, Top Bow Dressing

MACHINES, BROACHING—See Presses, Broaching

MACHINES, BUTTON — See Machines, Upholstery Button

MACHINES, Cam Cutting

Standard Machinery Co., Auburn, R. I. (See page 115.)

MACHINES, CARBON BURNING—See Machines, Motor Decarbonizing

MACHINES CHAMFERING — See Machines, Gear Tooth Chamfering

MACHINES, CIRCULAR SAWING—See Saws, Circular

MACHINES, COILING — See Machines, Spring Coiling

MACHINES, Crimping and Beading

Niagara Machine & Tool Works, Northland Ave., Buffalo, N. Y.

Peck, Stow & Wilcox Co., Southington, Conn. "Pexto."

Pettingell Machine Co., 79 Elm St., Amesbury, Mass.

Pexto—See Peck, Stow & Wilcox Co.

Quickwork—See Smith, H. Collier.

Smith, H. Collier, 807-15 Scotten Ave., Detroit, Mich. "Quickwork."

Stoll Co., D. H., 31 Lansing St., Buffalo, N. Y.

MACHINES, CYLINDER BORING — See Machines, Boring

MACHINES, CYLINDER GRINDING — See Grinders, Portable, Cylinder

MACHINES, CYLINDER REBORING—See Machines, Portable Cylinder Reboring

MACHINES, CYLINDER REGRINDING—See Machines, Portable Cylinder Regrinding

MACHINES, DECARBONIZING—See Machines, Motor Decarbonizing

MACHINES, Double Tread Tire Stitching

Bosworth Machinery Co., Campbell, 205 Lincoln St., Boston, Mass.

Landis Machine Co., 1515-27 N. 25th St., St. Louis, Mo.

MACHINES, DRESSING—See Machines, Top Bow Dressing

MACHINES, DRILLING—See Drills

MACHINES, Electric Welding

Electric Arc Cutting & Welding Co., 222 Halsey St., Newark, N. J.

Federal Machine & Welder Co., Dana Ave., Warren, O.

Geuder, Paeschke & Frey Co., 1422-1700 St. Paul Ave., Milwaukee, Wis. (See page 679.)

Thomson Electric Welding Co., 161 Pleasant St., Lynn, Mass.

Winfield Electric Welding Machine Co., Dana Ave., Warren, O.

MACHINES, Fender Rolling

Cleeso—See Republic Metalware Co.

Republic Metalware Co., 254 36th St., Brooklyn, N. Y. "Cleeso."

Yoder Co., Engineers Bldg., Cleveland, O.

MACHINES, Fender Wiring

Yoder Co., Engineers Bldg., Cleveland, O.

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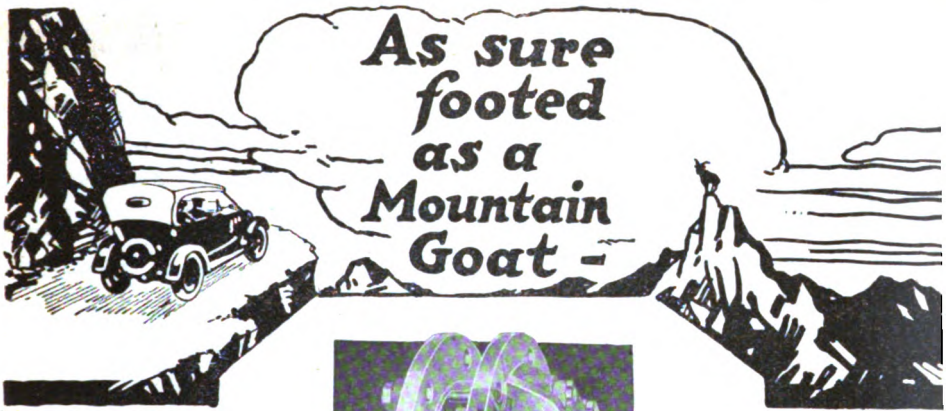

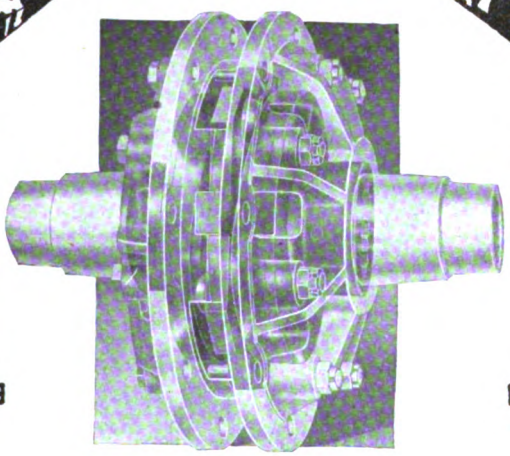

AS SURE-FOOTED AS A MOUNTAIN GOAT—Whether you be in mountain or in valley or in the most crowded thoroughfares of a big city you can make your car "As sure-footed as a mountain goat" by installing the Dorr Miller Differential. The Dorr Miller Differential operates on a new and simple principle. It does everything that the complicated differential of the conventional type does; but the Dorr Miller eliminates noise, wear and backlash and in addition does what the complicated differential cannot do—

Delivers uniform power to both driving wheels;

Prevents spinning of either wheel when one wheel has traction and the other has not—thereby saving tires and gasoline;

Eliminates expense of transmission, repairs and replacements as it is practically wearproof.

But four units compose the Dorr Miller Differential: a driving plate, two grooved blocks and eight steel balls through which the power is transmitted. When the car is running in a straight-away, all parts revolve as a unit. When the wheels are revolving at different speeds, the positions of the camblocks change by reverse movements in relation to the driving plate and balls.

This principle provides a retardation or locking action which prevents spinning and skidding.

Avoid delay by sending detail blue prints of your rear construction and make your car "As sure-footed as a mountain goat" by specifying the DORR MILLER DIFFERENTIAL.

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FACTORY: DETROIT

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MACHINES, Gear Cutting

Bilgram Machine Works, 1235 Spring Garden St., Philadelphia, Pa.

Bilton Machine Tool Co., 990 Housatonic Ave., Bridgeport, Conn.

Brown & Sharpe Mfg. Co., Promenade St., Providence, R. I.

Cincinnati Gear Cutting Machine Co., Elam St. & Garrard Ave., Cincinnati, O.

Fellows Gear Shaper Co., 24 Pearl St., Springfield, Vt.

Flather Mfg. Co., E. J., Nashua, N. H.

Garvin Machine Co., Spring & Varick Sts., New York, N. Y.

Gleason Works, 1000 University Ave., Rochester, N. Y.

Gould & Eberhardt, Chancelor & Coit Sts., Irvington, N. J.

Lees-Bradner Co., 6210 Carnegie Ave., Cleveland, O.

Newark Gear Cutting Machine Co., 67-69 Prospect St., Newark, N. J. (See page 357.)

Schuchardt & Schutte, 90 West St., New York, N. Y. (Importers.)

Sloan & Chace Mfg. Co., Sixth Ave. & 13th St., Newark, N. J.

Whiton Machine Co., D. E., 190 Howard St., New London, Conn.

MACHINES, Gear Hobbing

Adams Co., Dubuque, Ia.

Barber-Colman Co., Rockford, Ill.

Bilton Machine Tool Co., 990 Housatonic Ave., Bridgeport,, Conn.

Gould & Eberhardt, Chancelor & Coit Sts., Irvington, N. J.

Lees-Bradner Co., 6210 Carnegie Ave., Cleveland, O.

Meisselbach-Catucci Mfg. Co., 29 Congress St., Newark, N. J.

Newark Gear Cutting Machine Co., 67-69 Prospect St., Newark, N. J. (See page 357.)

Reynolds Pattern & Machine Co., Massillon, O.

Schuchardt & Schutte, 90 West St., New York, N. Y. (Importers.)

MACHINES, Gear Tooth Chamfering

Cross Gear & Engine Co., 820 Bellevue Ave., Detroit, Mich. (See page 437.)

Schuchardt & Schutte, 90 West St., New York, N. Y. (Importers.)

MACHINES, Hair Picking

Atlas—See Curtis & Marble Machine Co.

Atlas—See Lounsbery & Sons.

Curtis & Marble Machine Co., 72 Cambridge St., Worcester, Mass. "Atlas."

Empire—See Lounsbery & Sons.

Lounsbery & Sons, G. H., 107-09 W. Third St., Cincinnati, O. "Atlas," "Empire."

Prize—See Willcomb Co.

Willcomb Co., Geo., 62 Chardon St., Boston, Mass. "Prize."

MACHINES, HINGE FORMING—See Machines, Hood Hinge Forming

MACHINES, HOBBING—See Machines, Gear Hobbing

MACHINES, Hood Hinge Forming

Yoder Co., Engineers Bldg., Cleveland, O.

MACHINES, Leaf Spring Straightening

Lauer Machine Co., John, 108-14 St. Antoine St., Detroit, Mich.

MACHINES, Leather Measuring

Nightingale, J. E., 15 Mill St., Danvers, Mass.

Tufting Machine Supply Co., 263 Jefferson Ave., E., Detroit, Mich.

Turner Tanning Machinery Co., Peabody, Mass.

MACHINES, Louvre Forming

Mayo-Skinner Mfg. Co., 2115 Elston Ave., Chicago, Ill. (See page 539.)

MACHINES, Metal Testing

(For Metal Testing Instruments—See Instruments, Metal Testing)

Brinell—See Holz, Herman A.

Holz, Herman A., 7 Madison Ave., New York, N. Y. "Brinell." (See page 367.)

Olsen Testing Machine Co., Tinius, 500 N. 12th St., Philadelphia, Pa.

MACHINES, Milling

Adams Co., Dubuque, Ia.

Beaman & Smith Co., Gordon & Reynolds Ave., Providence, R. I.

Briggs—See Gooley & Edlund.

Brown & Sharpe Mfg. Co., Promenade St., Providence, R. I.

Carter & Hakes Machine Co., Winsted, Conn.

Cincinnati Milling Machine Co., Columbia Rd., Cincinnati, O.

Davenport Mfg. Co., W. College St., Meadville, Pa.

Duff, William E., York, Pa. (Dealer.) (See page 457.)

Fosdick Machine Tool Co., Blue Rock & Apple Sts., Cincinnati, O.

Fox Machine Co., 1811 W. Ganson St., Jackson, Mich.

Garvin Machine Co., Spring & Varick Sts., New York, N. Y.

Gooley & Edlund, Huntington St., Cortland, N. Y. "Briggs."

Hendey Machine Co., Torrington, Conn.

Ingersoll Milling Machine Co., Rockford, Ill.

Kearney & Trecker Co., (West Allis) Milwaukee, Wis.

Kempsmith Mfg. Co., 45th St. & Rogers Ave., (West Allis), Milwaukee, Wis.

Knight Machinery Co., W. B., 2025 Lucas St., St. Louis, Mo.

Le Blond Machine Tool Co., R. K., 4609-21 Eastern Ave. (Linwood), Cincinnati, O.

Lucas Machine Tool Co., E. 99th St. & L. S. & M. S. Ry., Cleveland, O. "Precision."

Milwaukee—See Kearney & Trecker Co.

Niles-Bement-Pond Co., 111 Broadway, New York, N. Y.

Oesterlein Machine Co., 2850 Spring Grove Ave., Cincinnati, O. "Ohio."

Ohio—See Oesterlein Machine Co.

Pratt & Whitney Co., 111 Broadway, New York, N. Y. (See page 73.)

Precision—See Lucas Machine Tool Co.

Rockford Machine Tool Co., Kiswaukee & 23d Sts., Rockford, Ill.

Rockford Milling Machine Co., Harrison Ave & 11th St., Rockford, Ill.

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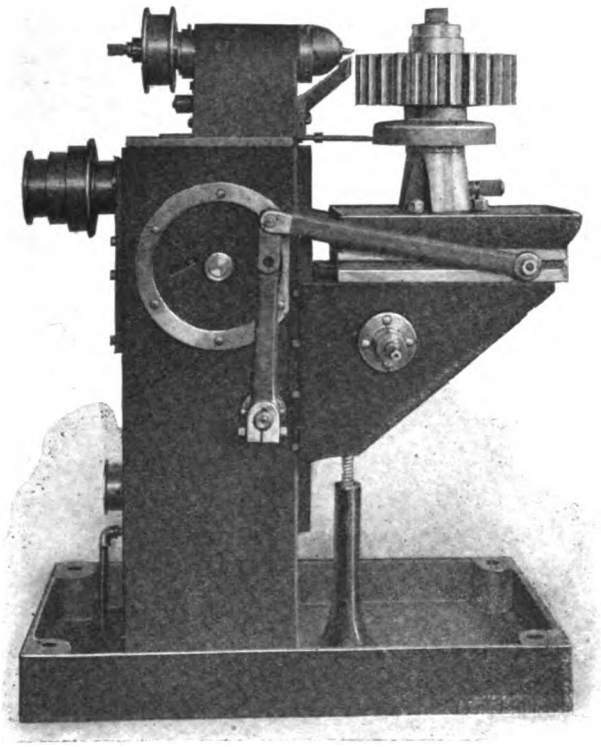
TO THE DISCRIMINATING TRADE



The CROSS GEAR TOOTH ROUNDER will give your gears a quality finish unheard of before, and on a production basis—25 to 30—6/8 pitch chrome nickel gear teeth per minute. Every tooth a perfect half round from outside to root.

Why not insist upon having your gears rounded on a CROSS when it **costs less** and the **quality is better.**

Any gears or fly wheel up to 36″ diameter and 2″ diametrical pitch.

The CROSS GEAR TOOTH ROUNDER is the original machine of this type and is amply protected by U. S. and Foreign Patents, allowed and pending.

Samples or details on request.

Manufactured and sold exclusively by

CROSS GEAR & ENGINE COMPANY

820 Bellevue Avenue **Detroit, Mich.**

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MACHINES, Milling (Continued)

Sloan & Chace Mfg. Co., Sixth Ave. & 13th St., Newark, N. J.

Steptoe Co., John, 2961 Colerain Ave., Cincinnati, O.

Thurston Mfg. Co., 419 Eddy St., Providence, R. I.

Valley City Machine Works, 12-16 Campau Ave., Grand Rapids, Mich.

Van Norman Machine Tool Co., Wilbraham Ave., Springfield, Mass.

Whitney Mfg. Co., Hartford, Conn. (See page 177.)

MACHINES, MORTISING—See Machines, Wood Mortising

MACHINES, Motor Decarbonizing

(Oxygen carbon burning outfits; for Chemical Carbon Removers—See Compounds, Carbon; for Chain or Ball Removers—See Removers, Carbon; for Steam Carbon Removers—See Moisteners, Air or Mixture)

Ashton, Laird & Co., 603-07 W. 43rd St. New York, N. Y. "Astra."

Astra—See Ashton, Laird & Co.

Auto Gas Light Co., Hazleton, Pa. "M-E."

Bateman Bros., 419 E. Bank St., Centerville, Ia. "O-So-Easy."

Bishop-Babcock-Becker Co., E. 49th St. & Hamilton Ave., Cleveland, O. "Eureka."

Champion—See Cleveland Faucet Co.

Cleveland Faucet Co., 708 Frankfort Ave., N. W., Cleveland O. "Champion."

Cox Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y.

Dyer Co., G. H., Cambridge, Mass. (See page 505.)

Eureka—See Bishop-Babcock-Becker Co.

Ferrier Mfg. Co., G. F., 231 S. Euclid Ave., Pittsburgh, Pa.

General Welding Co., 355-57 14th St., Hoboken, N. J. "Novel."

Imperial Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill. (See page 733.)

M-E—See Auto Gas Light Co.

Manufacturers Welding Co., 740 Jamaica Ave., Brooklyn, N. Y. "U. O. C."

Messer & Co., 121 N. Seventh St., Philadelphia, Pa.

Novel—See General Welding Co.

O-So-Easy—See Bateman Bros.

Oxweld Acetylene Co., 36th St. & Jasper Pl., Chicago, Ill.

Ozo Co., 18 Tremont St., Boston, Mass.

Prest-O-Carbon—See Prest-O-Lite Co.

Prest-O-Lite Co., 1400 Speedway, Indianapolis, Ind. "Prest-O-Carbon."

Rice & Dayton Mfg. Co., 115-19 E. Fourth St., Cedar Falls, Ia.

Sanford Mfg. Co., F. C., 2060 Fairfield Ave., Bridgeport, Conn.

Tolman Mfg. Co., 19-21 W. Third St., Boston, Mass.

U. O. C.—See Manufacturers Welding Co.

Vulcan Brazing & Machine Co., 1630-32 Vine St., Philadelphia, Pa.

Vulcan Process Co., 2450 University Ave., S. E., Minneapolis, Minn.

Vulite Chemical Co., 8 Sears St., Boston, Mass.

Waterhouse Welding Co., 15 Pelham St., Boston, Mass.

MACHINES, PICKING—See Machines, Hair Picking

MACHINES, Portable Cylinder, Reboring and Regrinding

(See also Bars, Boring)

Marvel Machinery Co., 1301 S. Third St., Minneapolis, Minn.

Storm Mfg. Co., Dept. D, Thompson, Ia. (See page 621.)

Universal Tool Co., Detroit, Mich. (See page 791.)

MACHINES, PORTABLE CYLINDER, REBORING AND REGRINDING, FOR FORDS—See Tools, Cylinder Reboring, for Fords

MACHINES, Propeller Boring

Yates Machine Co., P. B., 701 Fourth St., Beloit, Wis.

MACHINES, REBORING—See Machines, Portable Cylinder Reboring

MACHINES, REGRINDING—See Machines, Portable Cylinder Reboring

MACHINES, Screw

(Automatic)

Acme—See National Acme Co.

Automatic Machine Co., 113 E. Washington Ave., Bridgeport, Conn.

Brown & Sharpe Mfg. Co., Promenade St., Providence, R. I.

Chicago Automatic Machine Co., 400-08 N. Oakley Blvd., Chicago, Ill.

Cincinnati Automatic Machine Co. (Oakley), Cincinnati, O. "Hayden."

Cleveland Automatic Machine Co., Ashland Rd., Cleveland, O.

Davenport Machine Tool Co., 34 N. Second St., New Bedford, Mass.

Foster Machine Co., 1100 Beardsley Ave., Elkhart, Ind.

Hartford Machine Screw Co., Hartford, Conn. (See page 513.)

Hayden—See Cincinnati Automatic Machine Co.

National Acme Co., Cleveland, O. "Acme." (See page 477.)

New Britain Machine Co., New Britain, Conn. (See page 659.)

Peerless Automatic Machine Co., 1970 W. 77th St., Cleveland, O.

Potter & Johnston Machine Co., 1035 Newport Ave., Pawtucket, R. I.

Townsend Mfg. Co., H. P., Hartford, Conn.

MACHINES, Screw

(Hand)

Acme Machine Tool Co., Cincinnati, O.

Bardons & Oliver, 1133 W. Ninth St., Cleveland, O.

Dreses Machine Tool Co., 227-39 W. McMicken Ave., Cincinnati, O.

Foster Machine Co., 1100 Beardsley Ave., Elkhart, Ind.

Garvin Machine Co., Spring & Varick Sts., New York, N. Y.

Pratt & Whitney Co., 111 Broadway, New York, N. Y. (See page 73.)

Warner & Swasey Co., 5701 Carnegie Ave., Cleveland, O.

MACHINES, Screw Driving

Reynolds Pattern & Machine Co., Massillon, O.

MACHINES, Spring Leaf Tapering

Axelson Machine Co., Boyle Ave. & Randolph St., Los Angeles, Cal.

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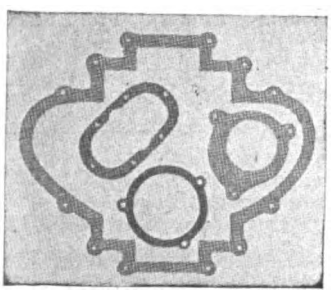

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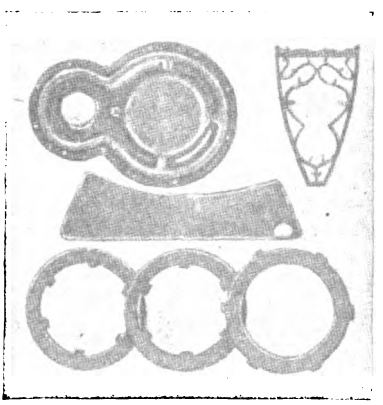

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MACHINES, SPRING STRAIGHTENING—See Machines, Leaf Spring Straightening

MACHINES, Spring Testing

Olsen Testing Machine Co., 500 N. 12th St., Philadelphia, Pa.

MACHINES, Tapping

Baker Bros., Westlake Ave. & Post St., Toledo, O.
Burke Machine Tool Co., Conneaut, O.
Garvin Machine Co., Spring & Varick Sts., New York, N. Y.
Hartford Machine Screw Co., Hartford, Conn. (See page 513.)
Pratt & Whitney Co., 111 Broadway, New York, N. Y. (See page 73.)
Rickert-Shafer Co., Erie, Pa.
St. Louis Machine Tool Co., 922-32 Loughborough Ave., St. Louis, Mo. "Western."
Western—See St. Louis Machine Tool Co.

MACHINES, TENONING—See Machines, Wood Mortising

MACHINES, TESTING—See Machines, Metal Testing; also Machines, Spring Testing

MACHINES, Tire Bandage Wrapping

Miller, Chas. E., 1400 S. Meridian St., Anderson, Ind.
Pierce Wrapping Machine Co., 617 W. Jackson Blvd., Chicago, Ill.
Rossman, Roy G., 707 E. Pike St., Seattle, Wash.
Terkelsen & Wennberg, 326 A St., Boston, Mass.
Thropp's Sons Co., John E., Trenton, N. J.

MACHINES, Tire Removing and Replacing

Weaver Mfg. Co., 2173 S. Ninth St., Springfield, Ill.

MACHINES, TIRE STITCHING—See Machines, Double Tread Tire

MACHINES, TOOTH CHAMFERING—See Machines, Gear Tooth Chamfering

MACHINES, Top Bow Dressing

Buob & Scheu, 500-10 Webster Ave., Cincinnati, O. "Peerless." (See page 711.)
Peerless—See Buob & Scheu.

MACHINES, TREAD STITCHING—See Machines, Double Tread Tire

MACHINES, TUFTING—See Machines, Upholstery Tufting

MACHINES, Upholstery Button

Handy—See Tufting Machine Supply Co.
Lounsbery & Sons, G. H., 107-09 W. Third St., Cincinnati, O.
Reliable—See Tufting Machine Supply Co.
Tufting Machine Supply Co., 268 Jefferson Ave., E., Detroit, Mich. "Handy," "Reliable."

MACHINES, Upholstery Tufting

Buser-Poston Tufting Machine Co., Chillicothe, O.
Novelty—See Tufting Machine Supply Co.
Tufting Machine Supply Co., 268 Jefferson Ave., E., Detroit, Mich. "Novelty."

MACHINES, Valve Seating and Grinding

(For Valve Seating Tools—See Tools, Valve Grinding)

B. F. S. Mfg. Co., 54 Hermon St., Worcester, Mass.
Eclipse Valve Grinder Co., Bonfils Bldg., Kansas City, Mo.
Foote-Burt Co., 4101 St. Clair Ave., Cleveland, O.
Fry Mfg. Co., B. L., Ninth & Monroe Sts., St. Louis, Mo.
Stenman Electric Valve Grinder Co., 42 Southbridge St., Worcester, Mass.
Taylor & Fenn Co., 54-70 Arch St., Hartford, Conn.
Veltum & Clow—See Warnock-Wirth Sales Co.
Warnock-Wirth Sales Co., 607 Douglas St., Sioux City, Ia. (Sole Distributers for Veltum & Clow, Eugene, Ore.)

MACHINES, WELDING—See Machines, Autogenous Welding; also Machines, Electric Welding

MACHINES, WIRING — See Machines, Fender Wiring

MACHINES, Wood Bending

Defiance Machine Works, 434 Perry St., Defiance, O.
Fay & Egan Co., J. A. 415 W. Front St., Cincinnati, O.

MACHINES, Wood Boring

Ajax Mfg. Co., 848 Jarvella St., Pittsburgh (N. S.), Pa.
American Wood Working Machinery Co., 591 Lyell Ave., Rochester, N. Y.
Bentel & Margedant Co., Hamilton, O.
Cordesman, Meyer & Co., 53-57 Central Ave., Cincinnati, O.
Cordesman-Rechtin Co., Cincinnati, O.
Defiance Machine Works, 434 Perry St., Defiance, O.
Fay & Egan Co., J. A., 415 W. Front St., Cincinnati, O.
Goodspeed Machine Co., 202 Spruce St., Winchendon, Mass.
Greenlee Bros & Co., 2100-2400 12th St., Rockford, Ill.
Jones Superior Machine Co., 1258-72 W. North Ave., Chicago, Ill.
Kane & Roach, Niagara & Shonnard Sts., Syracuse, N. Y.
Ober Mfg. Co., Chagrin Falls, O.
Oliver Machinery Co., Coldbrook & Clancy Sts., Grand Rapids, Mich.
Power & Co., L., 20 S. 23d St., Philadelphia, Pa.
Pryibil Machine Co., P., 512-24 W. 41st St., New York, N. Y.
Root Co., B. M., 30-36 Jefferson Ave., York, Pa.
Smith Machine Co., H. B., Smithville, N. J.
Valley City Machine Works, 12-16 Campau Ave., Grand Rapids, Mich.

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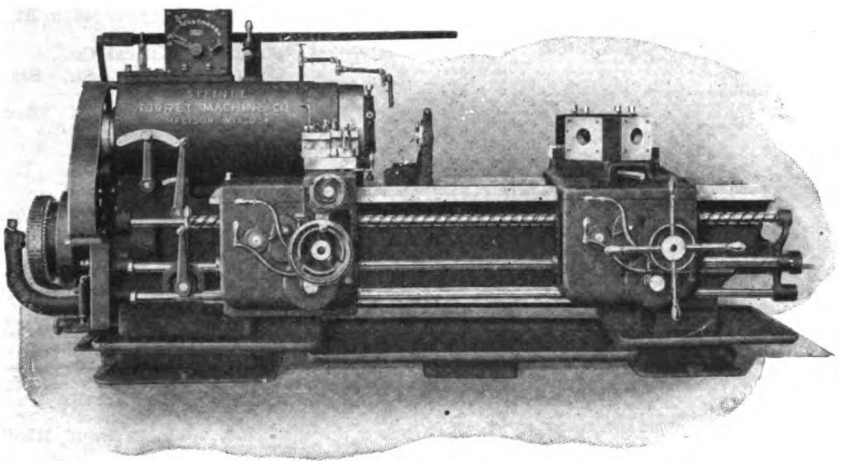
STEINLE TURRET MACHINE CO.

MADISON, WISCONSIN

Originators of the Heavy Duty Full Swing Side Carriage Turret Lathe



Standard Steinle 24" Full Swing Side Carriage Turret Lathe with 6¼" Hole Through Spindle as Arranged with Direct Connected Motor Drive

The machine shown above is the superior of any heavy duty turret lathe on the market as a general purpose machine. It has exclusive features that are invaluable and permit of better tooling arrangements than can be applied to any other machine of this character, thereby greatly increasing efficiency in point of quality and quantity of production.

This machine is used by the leading manufacturers of gasoline engines for all classes of service, including Liberty motor and other aviation motor cylinders; manufacturers of tractor motors, stationary engines, and marine gas engines. It has become a standard among the leading manufacturers of Liberty motors for boring, doming and recessing, and turning the crankcase insert of cylinders used in these motors.

Standard attachments can be furnished for the rapid production of pistons and rings for larger engines.

Heavy hubs for trucks and tractors as well as axle housings can be handled to better advantage on this machine than on any others, and many other parts such as transmission gear blanks, etc., are handled equally well.

Automobile or other manufacturers who are considering shell contracts will find this machine exceptionally efficient in the boring of 155-mm. shells or in turning out parts for larger shells.

Our Engineering Department is at your disposal. Send us drawings of your work and we will gladly give full information relative to producing it in our machine.

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MADISON, WISCONSIN

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MACHINES, Wood Mortising and Tenoning

American Wood Working Machinery Co., 591 Lyell Ave., Rochester, N. Y.
Cordesman-Rechtin Co., Cincinnati, O.
Defiance Machine Works, 434 Perry St., Defiance, O.
Fay & Egan Co., J. A., 415 W. Front St., Cincinnati, O.
Greenlee Bros. & Co., 2100-2400 12th St., Rockford, Ill.
Oliver Machinery Co., Coldbrook & Clancy Sts., Grand Rapids, Mich.

MACHINES, WRAPPING—See Machines, Tire Bandage Wrapping

MACHINISTS' HAMMERS—See Hammers, Machinists'

MAGNET CHARGERS—See Chargers, Magneto Magnet

MAGNET REMAGNETIZERS—See Chargers, Magneto Magnet

MAGNETIC CHUCKS—See Chucks, Magnetic

MAGNETIC PUMP SYSTEMS—See Systems, Magnetic Pump Gasoline

MAGNETO BRUSHES—See Brushes, Magneto, Starter and Generator

MAGNETO COUPLINGS—See Couplings, Magneto

MAGNETO COVERS—See Covers, Magneto

MAGNETO MAGNET CHARGERS—See Chargers, Magneto Magnet

MAGNETO METERS FOR FORDS — See Meters, Magneto

MAGNETO MOUNTING ATTACHMENTS —See Attachments, Magneto Mounting

MAGNETO PARTS—See Parts, Magneto Coil and Distributor

MAGNETO WINDINGS—See Windings

MAGNETOS, Aircraft

American Magneto Co., 1682 Fernwood Ave., Toledo, O. "Swiss."
Berling—See Ericsson Mfg. Co.
Berkshire Magneto Co., Fourth St., Pittsfield, Mass.
Bosch Magneto Co., 223 W. 46th St., New York, N. Y.
Dixie—See Splitdorf Electrical Co.
Eisemann Magneto Co., 32 33rd St., Brooklyn, N. Y. (See page 443.)
Ericsson Mfg. Co., Buffalo, N. Y. "Berling." (See page 445.)
K-W Ignition Co., 2900 Chester Ave., Cleveland, O. (See page 449.)
Remy Electric Co., 1623 E. Grand Blvd., Detroit, Mich.
Simms Magneto Co., Arlington Ave., East Orange, N. J.
Splitdorf Electrical Co., Newark, N. J. "Dixie."
Swiss—See American Magneto Co.

MAGNETOS, Ignition

American Magneto Co., 1682 Fernwood Ave., Toledo, O.
Berkshire Magneto Co., Fourth St., Pittsfield, Mass.
Berling—See Ericsson Mfg. Co.
Bosch Magneto Co., 223 W. 46th St., New York, N. Y.
Dixie—See Splitdorf Electrical Co.
Dow Mfg. Co., 131 Adams St., Braintree, Mass.
Eisemann Magneto Co., 32 33rd St., Brooklyn, N. Y. (See page 443.)
Ericsson Mfg. Co., Buffalo, N. Y. "Berling." (See page 445.)
Heco—See Heinze Electric Co.
Heinze Electric Co., Lowell, Mass. "Heco."
K-W Ignition Co., 2900 Chester Ave., Cleveland, O. (See page 449.)
Kingston—See Kokomo Electric Co.
Kokomo Electric Co., 1415 Webster St., Kokomo, Ind. "Kingston."
Lauraine Magneto Co., 1765 Broadway, New York, N. Y. (See page 447.)
Marburg Bros., 90 West St., New York, N. Y. (Importers.) "Mea."
Mea—See Marburg Bros.
Remy Electric Co., 1623 E. Grand Blvd., Detroit, Mich.
Simms Magneto Co., 277 N. Arlington Ave., East Orange, N. J.
Splitdorf Electrical Co., Newark, N. J. "Dixie."
Standard Ignition Co., Elkhart, Ind.
Swiss Magneto Co., Monroe, Mich.
Teagle Co., 1125 Oregon Ave., Cleveland, O.

MAGNETOS, Ignition, for Fords

Bosch Magneto Co., 223 W. 46th St., New York, N. Y.
Eisemann Magneto Co., 32 33d St., Brooklyn, N. Y. (See page 443.)
Splitdorf Electrical Co., Newark, N. J.

MAGNETOS, Motor Boat Ignition

American Magneto Co., 1682 Fernwood Ave., Toledo, O. "Elkhart," "Swiss."
Berkshire Magneto Co., Fourth St., Pittsfield, Mass.
Berling—See Ericsson Mfg. Co.
Bosch Magneto Co., 223 W. 46th St., New York, N. Y.
Dixie—See Splitdorf Electrical Co.
Eisemann Magneto Co., 32 33rd St., Brooklyn, N. Y. (See page 443.)
Elkhart—See American Magneto Co.
Ericsson Mfg. Co., Buffalo, N. Y. "Berling." (See page 445.)
K-W Ignition Co., 2900 Chester Ave., Cleveland, O. (See page 449.)
Motsinger Device Mfg. Co., 26th & Ferry Sts., Lafayette, Ind.
National Coil Co., N. Cedar St., Lansing, Mich.
Simms Magneto Co., 277 N. Arlington Ave., East Orange, N. J.
Splitdorf Electrical Co., Newark, N. J. "Dixie."
Swiss—See American Magneto Co.

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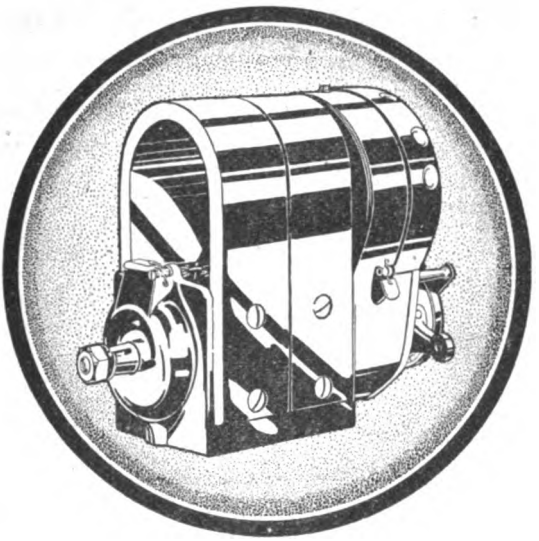

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This overwhelming preference for Eisemann Magnetos is no vogue of the moment. It is a growth of years. For Eisemann was the **pioneer** High Tension Magneto and there has been ample time to test it on its merits. The lead established at the start never has been yielded.

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MAGNETOS, Motorcycle Ignition

American Magneto Co., 1682 Fernwood Ave., Toledo, O. "Elkhart."

Berling—See Ericsson Mfg. Co.

Bosch Magneto Co., 223 W. 46th St., New York, N. Y.

Dixie—See Splitdorf Electrical Co.

Eisemann Magneto Co., 32 33rd St., Brooklyn, N. Y. (See page 443.)

Elkhart—See American Magneto Co.

Ericsson Mfg. Co., Buffalo, N. Y. "Berling." (See page 445.)

National Coil Co., N. Cedar St., Lansing, Mich.

Simms Magneto Co., 277 N. Arlington Ave., East Orange, N. J.

Splitdorf Electrical Co., Newark, N. J. "Dixie."

Teagle Co., 1125 Oregon Ave., Cleveland, O.

MAGNETOS, Tractor Ignition

American Magneto Co., 1682 Fernwood Ave., Toledo, O. "Swiss."

Berkshire Magneto Co., Fourth St., Pittsfield, Mass.

Berling—See Ericsson Mfg. Co.

Bosch Magneto Co., 223 W. 46th St., New York, N. Y.

Dixie—See Splitdorf Electrical Co.

Eisemann Magneto Co., 32 33rd St., Brooklyn, N. Y. (See page 443.)

Ericsson Mfg. Co., Buffalo, N. Y. "Berling." (See page 445.)

K-W Ignition Co., 2900 Chester Ave., Cleveland, O. (See page 449.)

Motsinger Device Mfg. Co., 26th & Ferry Sts., Lafayette, Ind.

National Coil Co., N. Cedar St., Lansing, Mich.

Remy Electric Co., 1623 E. Grand Blvd., Detroit, Mich.

Simms Magneto Co., 277 N. Arlington Ave., East Orange, N. J.

Splitdorf Electrical Co., Newark, N. J. "Dixie."

Standard Ignition Co., Elkhart, Ind.

Swiss—See American Magneto Co.

Teagle Co., 1125 Oregon Ave., Cleveland, O.

MAGNETS, Permanent

(For Magnetos)

Esterline Co., 228 E. South St., Indianapolis, Ind.

Lindenberg Steel Co., 90 West St., New York, N. Y. (Importers.)

MAHOGANY DOOR STRIPS FOR FORDS —See Strips, Wood Door

MAIN BEARING REAMERS FOR FORDS—See Reamers, Main Bearing and Connecting Rod

MALLEABLE CASTINGS—See Castings, Malleable Iron

MALLETS, BRASS AND COPPER—See Hammers, Brass and Copper

MALLETS, Rubber

(For use in place of a metal hammer on finished surfaces)

Thermoid Rubber Co., Trenton, N. J. (See pages 373 and 397.)

MANDRELS, Expanding

Alert Tool Co., 237 N. Sixth St., Philadelphia, Pa.

Champion—See Western Tool & Mfg. Co.

Le Count, Wm. G., Merritt St., South Norwalk, Conn.

Morse Twist Drill & Machine Co., New Bedford, Mass.

Nicholson & Co., W. H., 12 Oregon St., Wilkes-Barre, Pa.

Western Tool & Mfg. Co., Springfield, O. "Champion."

MANDRELS, Inner Tube

New Haven Sherardizing Co., New Haven, Conn.

MANGANESE STEEL—See Steel, Manganese

MANIFOLD REGISTERS—See Registers, Autographic and Manifold

MANIFOLDS, Intake and Exhaust

(Brazed and Welded Manifolds. For Cast Manifolds—See Castings)

A. Z. Co., 520 W. 56th St., New York, N. Y. (See page 563.)

American Tube Bending Co., 5-9 Lawrence St., New Haven, Conn.

Holmes, George L., 1733 Broadway, New York, N. Y. (Eastern distributor for "Wilmo Manifolds.) (See page 383.)

Imperial Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill. (See page 733.)

Ireland & Matthews Mfg. Co., Beard & Chatfield Sts., Detroit, Mich.

Jacobs Co., F. L., 449-53 Guoin St., Detroit, Mich. (See page 447.)

Miller Metalwork Co., Southington, Conn.

National Pipe Bending Co., River & Lloyd Sts., New Haven, Conn.

New Jersey Tube Co., Newark, N. J.

Roberts Brass Co., 249 Lake St., Milwaukee, Wis.

Standard Metal Mfg. Co., 237 Chestnut St., Newark, N. J.

Standard Metalwork Co., 92-108 Prospect St., Thompsonville, Conn.

Standard Parts Co., Cleveland, O. (See pages 408 and 409.)

Standard Tool & Mfg. Co., 68-72 E. Lafayette Ave., Detroit, Mich.

United Wire & Supply Co., 109-19 Summer St., Providence, R. I.

Weber Bros. Metal Works, 108-28 N. Jefferson St., Chicago, Ill.

Whittier Co., 2332 S. Michigan Ave., Chicago, Ill. "Wilmo." (See page 521.)

Wilmo—See Whittier Co.

MANIFOLDS, Intake, for Fords

(Special intake manifolds with exhaust gas or hot water jacket; see also Heaters, Mixture; for Kerosene Carburetors—See Carburetors, Kerosene)

Blake Mfg. & Engineering Co., S. M., 1215 Fourth Ave., Cedar Rapids, Ia. "Hot Shot."

Burn Oil Device Co., 129 N. Jefferson St., Peoria, Ill.

Coppock-Stubbs Co., 419 N. Capitol Ave., Indianapolis, Ind. (See page 691.)

Dallas Auto Device Co., 1013 Elm St., Dallas, Tex. "Gasaver."

Frankfort Carburetor Co., Frankfort, Ind. (See page 151.)

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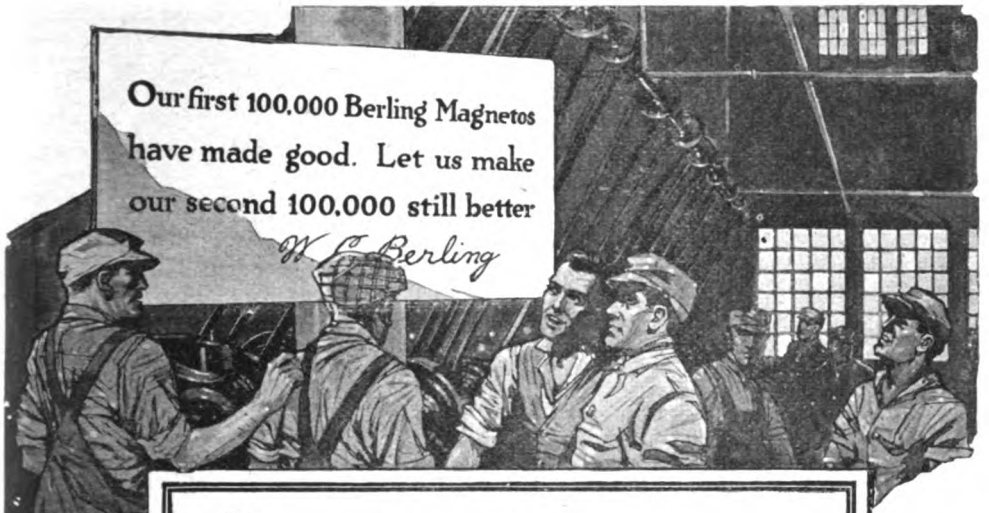


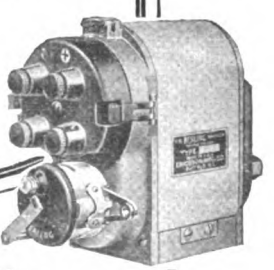
The spirit of the Berling organization

—Not content with the fact that the Berling Magneto has been chosen as best by leaders in the motor-truck industry and every other gasoline-motor field—

—The Berling organization is striving hard to do *more* than give the world a better magneto than it has ever had—

—Nothing short of perfection will satisfy the makers of the Berling Magneto.

ERICSSON MANUFACTURING CO.,
BUFFALO, N. Y.



Berling Magneto

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MANIFOLDS, Intake, for Fords (Continued)

G. P. Sales Co., 1806 Michigan Ave., Chicago, Ill. (See page 675.)

Galion Iron Works & Mfg. Co., Public Sq., Galion, O.

Gasaver—See Dallas Auto Device Co.

Hoag, Frank J., 91 Elm St., Cortland, N. Y.

Holmes, George L., 1733 Broadway, New York, N. Y. (Eastern Distributor for "Wilmo" Manifolds.) (See page 383.)

Hot Shot—See Blake Mfg. & Engineering Co.

J. E. S.—See Kerosene Motor Appliance Co.

K. B. C.—See Kerosene Burning Carburetor Co.

Kerosene Burning Carburetor Co., 1251 Michigan Ave., Chicago, Ill. "K. B. C."

Kerosene Motor Appliance Co., 245 W. 55th St., New York. "J. E. S."

Michigan Auto Products Co., Detroit, Mich. "Ospeco." (See page 605.)

Mishler, C. E., Elkhart, Ind.

Ospeco—See Michigan Auto Products Co.

Peck Super-Heater Co., 214½ Main St. S., Elkhart, Ind.

Shurnuff Mfg. Co.—See Zinke Co.

Sunderman Corp., 23 Chambers St., Newburgh, N. Y. (See page 151.)

Vaporator Mfg. Co., 2789 Washington Ave., St. Louis, Mo. (See page 447.)

Western Carburetor Co., Alma, Mich.

Whittier Co., 2332 Michigan Ave., Chicago, Ill. "Wilmo." (See page 521.)

Wilmo—See Whittier Co.

Zinke Co., 1323-25 Michigan Ave., Chicago, Ill. (Sole distributors for Shurnuff Mfg. Co., St. Louis, Mo.)

MANUAL ENGINE STARTERS—See Starters, Manual or Pedal or Lever Engine

MANUFACTURERS AGENTS

(Covering only Manufacturing Agents who advertise in this publication)

Auto Devices Co., 3212-14 Locust St., St. Louis, Mo. (See page 129.)

C. A. S. Engineering Co., 790 Woodward Ave., Detroit, Mich. (See pages 312 and 313.)

Denton & Anderson, Engineers Bldg., Cleveland, O. (See page 731.)

Faw, J. H., 37 Warren St., New York, N. Y. (See page 387.)

Gray-Heath Co., 1440 S. Michigan Ave., Chicago, Ill. (See Inside Back Cover.)

Jones Electric Co., Arthur, 2837 S. State St., Chicago, Ill. (See page 447.)

Levin, A. L., 1790 Broadway, New York, N. Y. (See page 25.)

Martin, Jas., 106 W. 52nd St., New York, N. Y. (See page 719.)

Motor Electrical Equipment Co., 1251 S. Michigan Ave., Chicago, Ill. (See page 483.)

New Era Spring & Specialty Co., 1138 Hamilton St., N.W., Grand Rapids, Mich. (See page 355.)

Reinhard Bros. Co., 11-13 S. Ninth St., Minneapolis, Minn. (See page 601.)

Western Motor Supply Co., 12th St. & Harmon Pl., Minneapolis, Minn. (See page 461.)

Zinke Co., 1323-25 Michigan Ave., Chicago, Ill. (See pages 543 to 552.)

MAPS, Road

Automobile Blue Book Publishing Co., 243 W. 39th St., New York, N. Y. (See pages 868 and 869.)

Clason Map Co., 1515 Tremont Pl., Denver, Colo.

Dover Route Indicator Co., Occoquan, Va.

Huebinger—See North American Publishing Co.

King, Sydney J., 626-36 S. Clark St., Chicago, Ill.

Mendenhall, C. S., Cincinnati, O.

North American Publishing Co., 216 E. Third St., Davenport, Ia. "Huebinger."

Walker Lithograph & Publishing Co., 400 Newbury St., Boston, Mass.

MARKET REPORTS—See Reports, Used Car Market

MARKING MACHINES—See Machines, Marking

MASTER VIBRATORS—See Coils, Spark

MASTER VIBRATORS FOR FORDS—See Vibrators, Master

MAT BINDING—See Binding, Mat and Carpet

MATS, CARPET—See Carpet, Coach

MATS, Cocoa

(Cocoa or Fiber Mats for car floors; for Cocoa Running Board Mats—See Mats, Running Board)

Darragh, Small & Co., 177 Water St., New York, N. Y.

Heywood Bros. & Wakefield Co., Wakefield, Mass.

Kempf & Son., Wm. F., 1027-33 N. Fourth St., Philadelphia, Pa.

McCabe & Bro., Benj., 37 E. 18th St., New York, N. Y.

Mat Co., 495 W. Western Ave., Muskegon, Mich.

Rancocas Mills, Trenton, N. J.

Wisconsin Mat Co., 392-94 Sixth St., Milwaukee, Wis.

MATS, Floor Board, for Fords

(Molded or formed rubber, leather or metal mats)

Federal Rubber Co., (Cudahy), Milwaukee, Wis.

Goodrich Co., B. F., S. Main St., Akron, O.

Mattson Rubber Co., Lodi, N. J.

Mayo & Co., F. A., Boston, Mass.

Mechanical Rubber Co., 307 W. Randolph St., Chicago, Ill.

Nathan Novelty Mfg. Co., 84-90 Reade St., New York, N. Y. (See page 153.)

Petley Rubber Mfg. Co., 241 Oregon St., Milwaukee, Wis. (See page 453.)

Spiro Mfg. Co., C., 68-72 E. 131st St., New York, N. Y. "Uniq."

Tyler Mfg. Co., 64-66 Pearl St., Boston, Mass.

Uniq—See Spiro Mfg. Co.

Wisconsin Mat Co., 392-94 Sixth St., Milwaukee, Wis.

MATS, Leather

Brockton Heel Co., Brockton, Mass.

MATS, LINOLEUM—See Linoleum

MATS, Rubber

(Rubber Mats and Matting for car floors or running boards)

Acme Rubber Mfg. Co., E. State St., Trenton, N. J.

Boston Belting Co., 34 Linden Park St., Boston, Mass.

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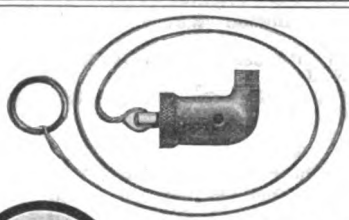

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Vaporator Mfg. Co., St. Louis

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Westinghouse Elec. and Mfg. Co.
Connecticut Tel. and Elec. Co.
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Eclipse Machine Co. (Bendix Drives)
Heinze-Springfield Ford Starters

Waltham Speedometers
Van Sicklen Speedmeters
Branford Ford Carburetors
Philadelphia Batteries

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MATS, Rubber (Continued)

Boston Woven Hose & Rubber Co., 110 Portland St., Cambridge, Mass. "Lenox," "Tiger."

Bowers Rubber Works, 68-70 Sacramento St., San Francisco, Cal.

Cincinnati Rubber Mfg. Co., Cincinnati, O. (See page 361.)

Combination Rubber Mfg. Co., Bloomfield, N. J.

Empire Rubber & Tire Co., Mulberry St., & Clinton Ave., Trenton, N. J.

Essex Rubber Co., Trenton, N. J.

Federal Rubber Co., (Cudahy), Milwaukee, Wis.

Goodrich Co., B. F., S. Main St., Akron, O.

Hamilton Rubber Mfg. Co., Mead & Prince Sts., Trenton, N. J.

Hewitt Rubber Co., 240 Kensington Ave., Buffalo, N. Y.

Home Tire Co., Trenton, N. J.

Lenox—See Boston Woven Hose & Rubber Co.

Manhattan Rubber Mfg. Co., Willett St., Passaic, N. J.

Mechanical Rubber Co., 307 W. Randolph St., Chicago, Ill.

Mechanical Rubber Co., C. & P. & Nickel Plate R. R., Cleveland, O.

Milford Rubber Works, Milford, Ill.

Monarch Rubber & Oil Cloth Co., Drexel Bldg., Philadelphia, Pa.

New Jersey Car Spring & Rubber Co., Wayne & Brunswick Sts., Jersey City, N. J.

New York Belting & Packing Co., 91 Chambers St., New York, N. Y.

Pennsylvania Rubber Co., Jeannette, Pa.

Petley Rubber Mfg. Co., 241 Oregon St., Milwaukee, Wis. (See page 453.)

Quaker City Rubber Co., 629 Market St., Philadelphia, Pa.

Thermoid Rubber Co., Trenton, N. J. (See pages 373 and 397.)

Tiger—See Boston Woven Hose & Rubber Co.

Victor Rubber Co., Springfield, O. (See page 697.)

Voorhees Rubber Mfg. Co., 18-46 Bostwick Ave. Jersey City, N. J.

MATS, Running Board

(Small mats for attaching to running boards for cleaning feet when entering car)

Acme Steel Goods Co., 2834-40 Archer Ave., Chicago, Ill.

Auburn Leather Goods Co., 3 Miller St., Auburn, N. Y. "Automat."

Automat—See Auburn Leather Goods Co.

Bailey, M. B.—See Wolfe & Co.

Brockton Heel Co., Brockton, Mass.

Continental Motor Equipment Co., 18 Broadway, New York, N. Y.

Heywood Bros. & Wakefield Co., Wakefield, Mass. "Slide-On," "Holdfast."

Holdfast—See Heywood Bros. & Wakefield Co.

Keystone Wire Matting Co., Beaver Falls, Pa.

Mat Co., 495 W. Western Ave., Muskegon, Mich. "Never-Slip."

Mosler & Co., A. R., Mt. Vernon, N. Y.

Rich Mfg. Co., 1777 Broadway, New York, N. Y. "Rico." (See page 277.)

Rico—See Rich Mfg. Co.

Never-Slip—See Mat Co.

Rudco—See Zinke Co

Ruddiman Co.—See Zinke Co.

Sanitary Wire Door Mat Co., 418 S. Lincoln St., Chicago, Ill.

Slide-On—See Heywood Bros. & Wakefield Co.

Stanwood Equipment Co., 307 Plymouth Ct., Chicago, Ill.

Tyler Mfg. Co., 64-66 Pearl St., Boston, Mass.

Wear Proof Mat Co., 500 S. Peoria St., Chicago, Ill.

Wisconsin Mat Co., 392-94 Sixth St., Milwaukee, Wis.

Wolfe & Co., C. W., 138 Centre St., New York, N. Y. (Sole Distributors for Bailey, M. B., New York, N. Y.) (See page 449.)

Zinke Co., 1323-25 Michigan Ave., Chicago, Ill. (Sole Distributors for F. G. Ruddiman Co., Ionia, Mich.) "Rudco." (See page 545.)

MATS, STEP—See Mats, Running Board

MATTING, Aluminum

(Stamped aluminum matting for covering floor or running boards)

Aluminum Co. of America, Pittsburgh, Pa.

Metallic Automobile Matting Co., Rochester, N. Y. ("Pyrma.") (See page 449.)

Pyrma—See Metallic Automobile Matting Co

Spiro Mfg. Co., C., 68-72 E. 131st St., New York, N. Y.

MATTING, LINOLEUM—See Linoleum

MATTING, RUBBER—See Mats, Rubber

MEASURING MACHINES—See Machines, Leather Measuring

MECHANICAL BELLS—See Bells, Mechanical

MECHANICAL CLEANERS—See Cleaners, Glass Wind Shield

MECHANICAL ENGINE STARTERS — See Starters, Mechanical or Spring Engine

MECHANICAL HORNS—See Horns, Mechanical

MECHANICS' GOGGLES—See Goggles, Mechanics' and Welders'

MEDICAL EMERGENCY CASES — See Cases, Medical

MERCURY RECTIFIERS—See Rectifiers, Alternating Current

METAL BODIES—See Bodies, Metal

METAL CEMENT—See Cement, Cast Iron

METAL DASHES—See Dashes, Metal

METAL FLOATS—See Floats, Metal

METAL FUNNELS—See Funnels and Measures, Metal

METAL GASKETS—See Gaskets, Metallic

METAL GEARS—See Gears, Metal

METAL HOSE—See Tubing, Flexible Metallic

METAL LACQUERS—See Laquers, Metal

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Made of special extra heavy aluminum that lasts longer than the car.
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Rochester **New York**

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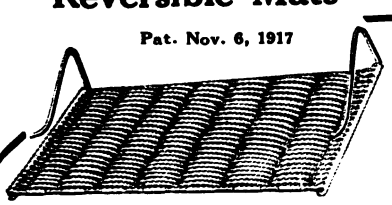

Size 9 x 14 inches

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Sell your customers a real mat! Kleen Kar Mats wear like the frame they are built on—that's iron.

Kleen Kar reversible automobile mat business is profitable. We have a dealer proposition that will interest you.

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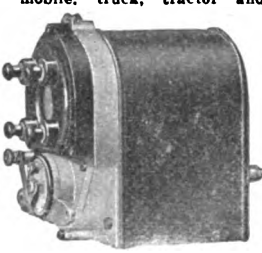

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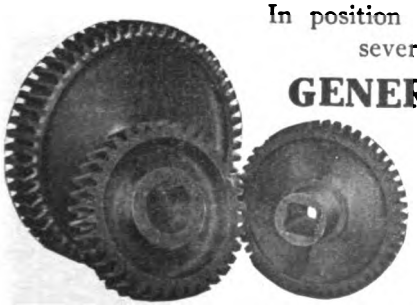

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METAL LINED HOSE—See Hose, Metal Lined

METAL LOCKERS—See Lockers, Metal

METAL MEASURES—See Funnels and Measures, Metal

METAL MUD GUARDS—See Guards, Metal Mud

METAL PINIONS—See Gears and Pinions, Metal

METAL PLANERS—See Planers, Metal

METAL POLISHES—See Polishes, Metal

METAL PRESSINGS—See Stampings

METAL RACKS—See Racks, Metal Tool, Stock and Tire

METAL SHAPERS—See Shapers, Metal

METAL SHELVING—See Racks, Metal Tool, Stock and Tire

METAL SNIPS—See Snips, Metal

METAL STAMPINGS—See Stampings and Pressings, Metal

METAL TESTING INSTRUMENTS—See Instruments, Metal Testing

METAL TESTING MACHINES—See Machines, Metal Testing

METAL TOOL BOXES—See Boxes, Wood Tool

METALLIC GASKETS—See Gaskets, Metallic

METALLIC GASKETS FOR FORDS—See Gaskets, Cylinder Head

METALS, Bearing

Acorn—See Cadman Mfg. Co.

Adamant—See Magnolia Metal Co.

Aetna Brass Mfg. Co., 1633 E. 55th St., Cleveland, O.

Albani—See Cox Brass Mfg. Co.

Aluminum Castings Co., Cleveland, O. "Lynux." (See page 157.)

American Bronze Corp., Berwyn, Pa. "Non-Gran." (See page opp. Inside Front Cover.)

American Bronze Co., 90-108 Arthur St., Buffalo, N. Y. "Grainless."

American Manganese Bronze Co., (Holmesburg), Philadelphia, Pa. "Spare's."

American Metal Products Co., 671 Kinnickinnic Ave., Milwaukee, Wis. "Ampco."

Ampco—See American Metal Products Co.

Anderson Foundry Co., Wm. B., 24-30 S. Clinton St., Chicago, Ill.

Auto-Crat—See Syracuse Smelting Works.

Azalea—See Vanadium Metals Co.

Bear Well—See Chicago Hardware Foundry Co.

Besley & Co., Charles H., 118-24 N. Clinton St., Chicago, Ill. "Helmet."

Birkenstein & Sons, S., 397 W. Ontario St., Chicago, Ill. (See page 395.)

Blake, Edwin J., 665 Windsor St., Hartford, Conn.

Blatchford Co., E. W., 230 N. Clinton St., Chicago, Ill.

Bound Brook Oil-less Bearing Co., Bound Brook, N. J.

Brass & Bronze Castings Co., 6515 Carnegie Ave., S. E., Cleveland, O. "Meteor."

Bridgeport—See Monumental Bronze Co.

Bunting Brass & Bronze Co., 737 Spencer St., Toledo, O. (See page 157.)

Cadman Mfg. Co., A. W., 2314-16 Smallman St., Pittsburgh, Pa. "Acorn."

Carson-Rowell Co., Union & Hancock Sts., Appleton, Wis.

Chamet—See Chase Rolling Mill Co.

Chase Rolling Mill Co., Waterbury, Conn. "Chamet."

Chicago Hardware Foundry Co., North Chicago, Ill. "Bear Well."

Climax—See North American Smelting Co.

Clover Leaf—See Williams & Son.

Colorado Lead Works Co., 1516 Blake St., Denver, Colo.

Columbia Smelting & Refining Works, 365-67 West St., New York, N. Y.

Columbian Brass Foundry, Freeport, N. Y. "Excello."

Copaloy—See Michigan Smelting & Refining Co.

Cox Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y. "Albani."

Cramp & Sons Ship & Engine Building Co., William, Philadelphia, Pa. "Parsons." (See page 453.)

Damascus Bronze Co., Pittsburgh, Pa.

Dann Products Co., 1096 E. 152d St., Cleveland, O. "Dannite."

Dannite—See Dann Products Co.

Dayton Bronze Bearing Co., 916-18 E. Third St., Dayton, O.

Delaware Brass & Aluminum Co., 20th & Walnut Sts., Muncie, Ind.

Dutch Boy—See National Lead Co.

Edna Brass Mfg. Co., 525-33 Reading Rd., Cincinnati, O.

Electric Smelting & Aluminum Co., 555 W. Jackson St., Lockport, N. Y.

Elephant—See Phosphor Bronze Smelting Co.

Empire Metal Co., 320 E. Water St., Syracuse, N. Y. "Premier," "Triumph."

Eureka Brass Co., 2210-18 Scott Ave., St. Louis, Mo.

Eureka Co., North East, Pa.

Excello—See Columbian Brass Foundry.

Fahrig Metal Co., 34 Commerce St., New York, N. Y. (See page 485.)

Federal Brass Works, 362-74 Trombley Ave., Detroit, Mich.

Frictionless Metal Co., Chattanooga, Tenn.

Gardiner Metal Co., 1356-64 W. Lake St., Chicago, Ill.

General Aluminum & Brass Mfg. Co., Detroit, Mich. (See page 155.)

General Bronze Foundry Co., 4800 Hamilton Ave., Cleveland, O. "Werne."

Germann Bronze Co., 355 W. 19th St., Erie, Pa.

Graham & Co., James, 293 Wooster St., New Haven, Conn.

Grainless—See American Bronze Co.

Great Western Smelting & Refining Co., 41st & Wallace Sts., Chicago, Ill.

Harper, Thomas, 204 Lafayette St., New York, N. Y. "Hi-Servis."

Hecla—See Paulson & Son.

Helmet—See Besley & Co.

Henning & Sons, V., 314-36 Belmont Ave., Brooklyn, N. Y.

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VITALOY is a bearing bronze that is ideally adapted for bushings and bearings. It will stand up under the hardest kind of usage and give thoroughly satisfactory service.

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Experimental and Contract Work.
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Cleveland, Ohio, U. S. A.

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METALS, Bearing (Continued)

Hi-Servis—See Harper, Thomas.
Howard Metal Co., Second & Canal Sts., Reading, Pa.
Hoyt Metal Co., 300 N. Broadway, St. Louis, Mo. "Trojan." (See page 161.)
Ideal Bronze Co., Cleveland, O. "Vita-Loy." (See page 451.)
Illinois Smelting & Refining Co., 408 N. Peoria St., Chicago, Ill. (See page 525.)
Jacobson & Sons Co., J. M., 70-72 Catherine St., Detroit, Mich. "Motex." (See page 859.)
Johnson Bronze Co., Mill St., New Castle, Pa.
Kahn Bros., 775-97 Humboldt St., Brooklyn, N. Y.
Kelly Brass Works, 226 W. Ontario St., Chicago, Ill.
Kramm Foundry Co., 1120-30 E. Georgia St., Indianapolis, Ind. (See page 865.)
Lehman Bros., Fourth & Jefferson Sts., Hoboken, N. J. (See page 527.)
Light Mfg. & Foundry Co., Pottstown, Pa.
Lissberger & Son, Marks, 281 Borden Ave., Long Island City, N. Y.
Lumen Bearing Co., 197 Lathrop St., Buffalo, N. Y.
Lynux—See Aluminum Castings Co.
McGill Metal Co., Valparaiso, Ind.
McKenna Brass & Mfg. Co., First Ave. & Ross St., Pittsburgh, Pa. (See page 481.)
Magnolia Metal Co., 113-15 Bank St., New York, N. Y. "Adamant."
Merchant & Evans Co., Philadelphia, Pa. "Silver Genuine." (See page 377.)
Meteor—See Brass & Bronze Castings Co.
Michigan Smelting & Refining Co., Detroit, Mich. "Copaloy."
Modern Die & Tool Co., Indianapolis, Ind. "Victor." (See page 349.)
Mogul Metal Co., Detroit, Mich. (See page 167.)
Monumental Bronze Co., 354 Howard St., Bridgeport, Conn. "Bridgeport."
More-Jones Brass & Metal Co., 3132-44 N. Broadway, St. Louis, Mo.
Motex—See Jacobson & Sons Co.
Muzzy-Lyon Co., Detroit, Mich. (See page 167.)
National Lead Co., 111 Broadway, New York, N. Y. "Dutch Boy." (See page 519.)
Non-Gran—See American Bronze Corp.
North American Smelting Co., 900 W. Thompson St., Philadelphia, Pa. "Vulcan," "Philadelphia," "Climax."
Oberdorfer Brass Co., M. L., 804 E. Water St., Syracuse, N. Y.
Parsons—See Cramp & Sons.
Paulson & Son, Thomas, 97 Second Ave., Brooklyn, N. Y. "Hecla." (See page 211.)
Philadelphia—See North American Smelting Co.
Phosphor Bronze Smelting Co., 2200 Washington Ave., Philadelphia, Pa. "Elephant."
Pittsburgh White Metal Co., 2116 Penn Ave., Pittsburgh, Pa.
Premier—See Empire Metal Co.
Reeves & Co., Paul S., 1415-25 Catharine St., Philadelphia, Pa.
Revolution—See Sanford Co.
Rhoades & Co., R. W., 15-17 West Ave., Long Island City, N. Y.
Richards & Co., 200-06 Causeway St., Boston, Mass.
Ryerson & Son, Joseph T., 2558 W. 16th St., Chicago, Ill.
Sanford Co., David C., 33-39 Drouve St., Bridgeport, Conn. "Revolution."
Semper Idem—See Wildes Son.
Sherwood Brass Works, 1167 Jefferson Ave., E., Detroit, Mich.
Shonberg, I., 122 Flushing Ave., Brooklyn, N. Y. "Bear."
Silver Genuine—See Merchant & Evans Co.
Spare's—See American Manganese Bronze Co.
Stanley—See Syracuse Smelting Works.
Syracuse Smelting Works, 192 Diamond St., Brooklyn, N. Y. "Auto-Crat," "Stanley."
Thiery & Kendrick Mfg. Co., Detroit, Mich. (See page 185.)
Titan Metal Co., Bellefonte, Pa.
Triumph—See Empire Metal Co.
Trojan—See Hoyt Metal Co.
U S A—See United Smelting & Aluminum Co.
United Smelting & Aluminum Co., 183-89 Commerce St., New Haven, Conn. "U S A."
Vanadium—See Enterprise Metal Co.
Vanadium Metals Co., Vanadium Bldg., Pittsburgh, Pa. "Azalea."
Victor—See Modern Die & Tool Co.
Vita-Loy—See Ideal Bronze Co.
Vulcan—See North American Smelting Co.,
Wellman Bronze Co., 6017 Superior Ave., Cleveland, O.
Werne—See General Bronze Foundry Co.
Whitehouse-Le Compte Mfg. Co., 42-54 Elm St., Newark, N. J.
Wildes Son, Thomas, 14 Dover St., New York, N. Y. "Semper Idem."
Williams & Son, E. A., 105-11 Plymouth St., Jersey City, N. J. "Clover Leaf."
Wing & Co., J. T., 15-19 Woodward Ave., Detroit, Mich.
Zenite Metal Co., 201-05 N. West St., Indianapolis, Ind. (See page 469.)

METALS, DEALERS IN—See Steel, Dealers In

METERS, AEROPLANE ALTITUDE—See Altimeters; Also Barographs

METERS, AMPERE—See Ammeters and Voltmeters; also Gages, Battery

METERS, COMPRESSION—See Gages, Cylinder Compression

METERS, Dashboard Gasoline

(For indicating the consumption of fuel per mile)

Masters, Irwin W., Johnson Bldg., Muncie, Ind. (See page 797.)

METERS or ODOMETERS, Distance Recording

(For combined Odometers and Speedometers—See Speedometers)

American Taximeter Co., 16 W. 61st St., New York, N. Y. "Dreadnaught."
Baumgaertner, F., 2344 E. 105th St., Cleveland, O. "Coronet."
Coronet—See Baumgaertner, F.
Dreadnaught—See American Taximeter Co.
Jones Speedometer Co., Bush Terminal, Brooklyn, N. Y.
Stewart-Warner Speedometer Corp., Chicago, Ill. (See page 499.)
Veeder Mfg. Co., 22 Sargeant St., Hartford, Conn.

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Furnished either in PARSONS' WHITE BRASS or CRAMP'S SPECIAL BEARING BRONZE. Sizes of bars not shown in the list and cored whole and half bushings with end collars can be furnished from stock patterns. In ordering refer to the number in first column.

PARSONS' WHITE BRASS for main engine and crank pin bearings.

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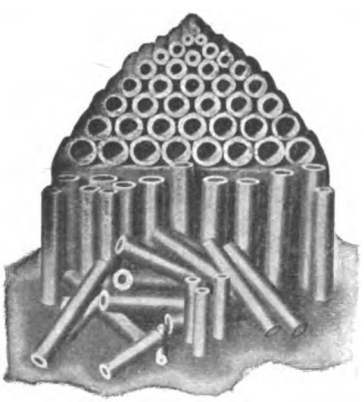

List of cored and solid cast bars of our bearing metals in stock:

	Outside Diameter. Inches.	Inside Diameter. Inches.	Length. Inches.
1.....	1	½	6
2.....	1¼	½	6
3.....	1½	¾	12
4.....	1¾	¾	12
5.....	1¾	1	12
6.....	2	1	12
7.....	2	1¼	12
8.....	2¼	1	12
9.....	2¼	1¼	12
10.....	2½	1¼	12
11.....	2½	1½	12
12.....	2¾	1½	12
13.....	2¾	1¾	12
14.....	3	2	12
15.....	3	2¼	12
16.....	3¼	2¼	12
17.....	3¼	2½	12

Solid bars up to 2 inches diameter.

THE WILLIAM CRAMP & SONS SHIP AND ENGINE BUILDING CO.
PHILADELPHIA, PA.

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METERS, Distance Recording, for Fords

(See also Speedometers and Odometers)

Veeder Mfg. Co., 22 Sargeant St., Hartford, Conn.

METERS, Gasoline or Oil

(For use in connection with Gasoline or Oil Storage Systems to indicate or record the amount drawn out)

Bowser & Co., S. F., Fort Wayne, Ind.

Buffalo Meter Co., 2893 Main St., Buffalo, N. Y. "Niagara." (See page 457.)

Niagara—See Buffalo Meter Co.

Tokheim Oil Tank & Pump Co., Fort Wayne, Ind.

METERS, Grade

(For attaching to car to indicate degree of grades)

Adams Co., Dubuque, Ia. "Gradometer."

Evergood—See Grossman Mfg. Co.

Gradometer—See Adams Co.

Grossman Mfg. Corp., Emil, Bush Terminal, Bldg. No. 20, Brooklyn, N. Y. "Evergood."

Weinhagen, H., 159-65 Leonard St., New York, N. Y.

METERS, Heat Indicating

(For attachment to radiator to show temperature of cooling water)

Auto Block Signal Co., Continental & Commerce Nat'l Bank Bldg., Chicago, Ill.

Boyce Moto-Meter—See Moto-Meter Co.

Foxboro Co., Foxboro, Mass.

Metalware Corp.—See Zinke Co.

Moto-Meter Co., Long Island City, N. Y. "Boyce Moto-Meter." (See page 455.)

Motor Eye—See Zinke Co.

Zinke Co., 1323-25 Michigan Ave., Chicago, Ill. (Sole Distributors for Metalware Corp., Chicago, Ill.) "Motor Eye." (See page 552.)

METERS, Heat Indicating, for Fords

(For attachment to radiator to show temperature of cooling water)

Boyce Moto-Meter—See Moto-Meter Co.

Moto-Meter Co., Long Island City, N. Y. "Boyce Moto-Meter." (See page 455.)

METERS, Magneto, for Fords

Eeco—See Electric Equipment Co.

Electric Equipment Co., 1152 S. Grand Ave., Los Angeles, Cal. "Eeco."

Hoyt Electrical Instrument Works, Penacook, N. H. (See page 507.)

St. Louis Electrical Works, 4057 Forest Park Blvd., St. Louis, Mo. (See page 269.)

METERS, OIL—See Meters, Gasoline

METERS, Radiator Water Level Indicating

Bastian & Laga, 535 W. 112th St., New York, N. Y. "Radiometer." (See page 569.)

Radiometer—See Bastian & Laga.

METERS, SPEED—See Speedometers

METERS, TAXI—See Taximeters

METERS, Truck Load Indicating

Loadometer Co., Industrial Bldg., Baltimore, Md. "Troll."

Troll—See Loadometer Co.

METERS, VOLT—See Ammeters and Voltmeters; also Gages, Battery

MICA SHEETS, TUBES, WASHERS and CORES

American Mica Co., Newton Lower Falls, Mass.

Asheville Mica Co., Asheville, N. C.

Chicago Mica Co., Lincoln & Campbell Sts., Valparaiso, Ind. "Mica-Bond."

Dielectric Mfg. Co., 224 S. Vandeventer Ave., St. Louis, Mo.

Hill Insulating & Mfg. Corp., 511-13 W. 42d St., New York, N. Y. (See page 513.)

Mica Mfg. Co., 150-52 Chambers St., New York, N. Y.

Micabond—See Chicago Mica Co.

Munsell & Co., Eugene, 63 Church St., New York, N. Y.

New York Mica & Mfg. Co., Clark & Green Sts., Auburn, N. Y.

Preston Co., Robert K., Monadnock Bldg., Chicago, Ill. "Prestonite."

Prestonite—See Preston Co.

Richmond Mica Co., 321-23 S. Ninth St., Richmond, Va.

Schoonmaker Co., A. O., 88 Park Pl., New York, N. Y.

Tar Heel Mica Co., Plumtree, N. C.

United Mica Co., Grafton Center, N. H.

Watson Bros., 170 Purchase St., Boston, Mass

MICA, TIRE—See Talc, Tire

MICROMETER CALIPERS

Brown & Sharpe Mfg. Co., Promenade St., Providence, R. I.

Coats Machine Tool Co., 30 Church St., New York, N. Y. "Prestwich."

Columbia—See Smith, E. G.

Goodell-Pratt Co., Greenfield, Mass. (See page 751.)

Prestwich—See Coats Machine Tool Co.

Reed Small Tool Works, Worcester, Mass.

Slocomb Co., J. T., 35 Oxford St., Providence, R. I.

Smith, E. G., 315 W. Park Ave., Tampa, Fla. "Columbia."

Starrett Co., L. S., Athol, Mass.

MILEAGE INDICATORS—See Meters, Distance

MILLING ATTACHMENTS—See Attachments, Lathe Milling

MILLING COMPOUNDS—See Lubricants, Cutting

MILLING CUTTERS—See Cutters, Milling, also Reamers and Cutters, Recutting of

MILLING MACHINE CHUCKS — See Chucks, Milling Machine

MILLING MACHINE VISES—See Vises, Milling Machine

MILLING MACHINES—See Machines, Milling

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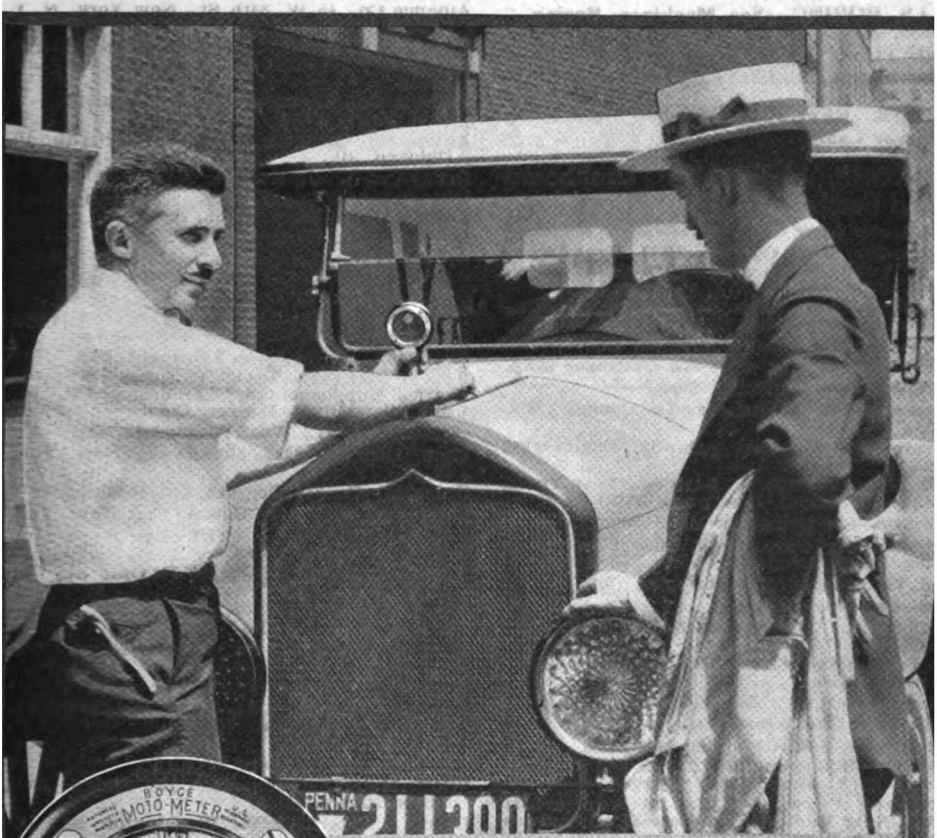

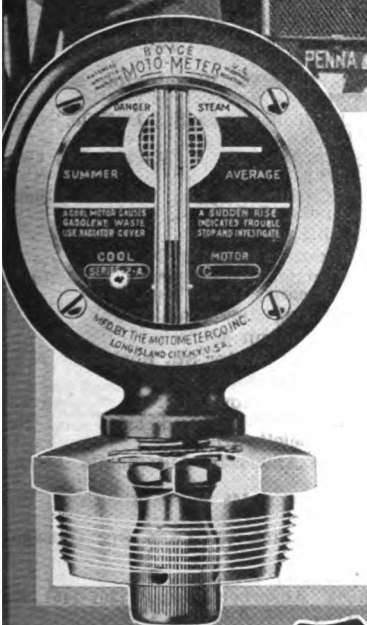

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Six models ranging in price from $2.50 to $10

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Long Island City, N. Y.

Creators of motor heat indicators
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THE MOTOR TEMPERATURE INDICATOR

BOYCE MOTO METER

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MILLS, BORING—See Machines, Boring

MINIATURE INCANDESCENT LAMPS—See Lamps, Miniature Incandescent

MIRROR REFLECTORS—See Reflectors, Mirror Lamp

MIRRORS, Adjustable Dashboard and Fender

(To enable driver to see to the rear of the car)

Alexander Mfg. Co., J., 1931 Broadway, New York, N. Y. "Mirrorscope." (See page 457.)

Amesbury Bent Glass Co., Carriage Ave., Amesbury, Mass.

Argos—See Motor Car Equipment Co.

Auto Mirror & Mfg. Co.—See Oettinger Corp.

Autoscope—See Oettinger Corp.

Autoscope—See Whitehouse-Le Compte Mfg. Co.

Carsafe—See Western Atlantic Engineering Co.

E. G. Mfg. Co., 250 W. 54th St., New York, N. Y. (Dealers.) (See page 215.)

Evergood—See Grossman Mfg. Corp.

Grossman Mfg. Corp., Emil, Bush Terminal, Bldg. No. 20, Brooklyn, N. Y. "Evergood."

Hind View—See Kales Stamping Co.

Hoco—See Hoeft & Co.

Hoeft & Co., Ashland Ave. & Kinzie St., Chicago, Ill. "Hoco."

Kales Stamping Co., 443-59 Lafayette Blvd., Detroit, Mich. "Hind View."

Kilborn-Sauer Co., Fairfield, Conn.

Lamb Mfg. Co., Winsted, Conn.

Mirrorscope—See Alexander Mfg., Co.

Motor Car Equipment Co., 21 W. 62d St., New York, N. Y. (Importers.) "Argos."

Oettinger Corp., F. W., 25 Vanderbilt Ave., New York, N. Y. (Sole Distributors for Auto Mirror & Mfg. Co., New York, N. Y.) "Autoscope," "Reer Flex." (See page 305.)

Reer Flex—See Oettinger Corp.

Riley-Klotz Mfg. Co., 17 Mulberry St., Newark, N. J.

Rosco—See Rosen & Co.

Rosen & Co., A. W., 610-14 Broadway, New York, N. Y. "Rosco."

Starr Bros., East Hampton, Conn.

Western Atlantic Engineering Co., 35 W. 32d St., New York, N. Y. "Carsafe."

Whitehouse-Le Compte Mfg. Co., 42-54 Elm St., Newark, N. J. "Autoscope."

MIRRORS, Water Gage

(To make possible the reading of water gages on steam cars from the seat)

Knox Co., Frank J., Hartford, Conn.

MITTENS, Aviators—See Gloves and Mittens, Aviators

MIXERS, ECONOMIZERS or AGITATORS and AUXILIARY AIR VALVES

Advance Automobile Accessories Corp., Dept. K10-1, 56 E. Randolph St., Chicago, Ill. "Myle-Mayker." (See page 423.)

Aer-In—See Ware Bros.

Aerofram Co., 107 Massachusetts Ave., Boston, Mass.

Albrecht-Ingraham Co., 308 S. Third St., Minneapolis, Minn.

Alliance Co., 45 W. 34th St., New York, N. Y. "Hugill."

American Automobile Accessories Co., B. & O. R. R. & Blue Rock St., Cincinnati, O. "Litl-Fiend."

Aristos Co., Warren O. "Economy." (See page 459.)

Automatic Carburetor Co., 1422 Bryan Pl., Chicago, Ill.

Bailey Co., W. J., Newark, N. J. "C. B."

Bell Gasoline Saver Co., 1909 Pennsylvania Ave., N. W., Washington, D. C.

Boucher, Geo. S., Damascus, Va.

Brown-Taylor-Greene Co., 1323-25 S. Michigan Ave., Chicago, Ill. "Empire."

C. B.—See Bailey Co.

Carburetor Mantle Co., 1914 Broadway, New York, N. Y. (See page 255.)

Champion, F. M., 236 Elizabeth St., Utica, N. Y.

Charles Supplementary Carburetor Co., 5020 Montview Blvd., Denver, Colo.

Clemmer, G. H., West Alexandria, O.

Cook, Geo. E., 2322 Broadway, New York, N. Y.

Crone, F. G., 334 Genesee St., Buffalo, N. Y.

Deppe, W. P., 127 Duane St., New York, N. Y. "Stanley."

Economy—See Aristos Co.

Edelmann & Co., E., 341-63 E. Ohio St., Chicago, Ill. "Jumbo."

Elder Mfg. Co., 2305 N. Illinois St., Indianapolis, Ind. "Radio."

Flintham & Gilstrap Co., Topeka, Kans. "Votalizer."

Gasco—See Gasket Supply Co.

Gasket Supply Co., 1728 Ludlow St., Philadelphia, Pa., "Gasco." (See page 439.)

Gassave—See Leathers Bros. Co.

"Go" Motor-Speeder Co., 165 Third Ave., Three Rivers, Mich.

Grace & Co., 3205 W. Washington St., Los Angeles, Cal.

Hard Mfg. Co., Tonawanda St., Buffalo, N. Y. "Superfector."

Hine-Watt Mfg. Co., 180 N. Market St., Chicago, Ill. "Sly."

Hoosier Sub-Carburetor Co., 309 N. Illinois St., Indianapolis, Ind.

Hugill—See Alliance Co.

Ieco—See Interstate Electric Co.

Interstate Electric Co., Baronne & Perdido Sts., New Orleans, La. "Ieco."

Jenkins Vector Co., Richmond, Va.

Jumbo—See Edelmann & Co.

Kelley, J. M., 80 N. Water St., Rochester, N.Y.

Kero-Mix—See Patterson, F. W.

Leathers Bros. Co., Howard, Pa. "Gassave."

Lipman Refrigerator-Car and Mfg. Co., 206 Pleasant St., Beloit, Wis.

Litl-Fiend—See American Automobile Accessories Co.

Lovelace & Horken, 448 N. Capitol Ave., Indianapolis, Ind.

Lydon Mfg. Co., 108 W. Lake St., Chicago, Ill. "Speedler."

M & M Sales Co., Lewiston, Pa.

Martin Shock Absorber Corp., 1301-1401 E. Slauson Ave., Los Angeles, Cal.

Mix-O-Lock—See National Motor Supply Co.

Myle-Mayker—See Advance Auto Accessories Corp.

National Auto Accessories Co., Pittsburgh, Pa.

National Motor Supply Co., Painesville, O. "Mix-O-Lock."

Oxygenerator Co., 1919 Michigan Ave., Chicago, Ill.

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Vertical Dial Meter

NIAGARA METERS

FOR GASOLINE AND OIL

Sizes	Capacity Gals per hr.	Pipe Size	List Flat Dial Meter	List Vertical Dial Meter
A	6 to 300	½ inch	$20.00	
B	10 to 500	½ or ¾	20.00	40.00
C	30 to 1000	¾ or 1	30.00	50.00
D	60 to 2000	1 or 1¼	40.00	
EV	90 to 3000	1¼ or 1½	60.00	
E	120 to 4000	1¼ or 1½	80.00	
F	175 to 6000	1½ or 2	120.00	
G	250 to 9000	2 or 2½	160.00	
G	250 to 9000	3	200.00	

Suitable for oils of all kinds and all temperatures, and for pressure from pumps, gravity air or water.

BUFFALO METER CO.
Est. 1892
2893 Main St., Buffalo, N. Y.

"Mirroscope"
TRADE MARK

Made of a real Lens ground to 50 "minus." This gives a true reflection of approaching danger through a wide angle instead of the distorted, limited image or the image given by a bent glass or ordinary plate. Made in all sizes and shapes to fit any car.

No.	Size	Each
530	4" Round	$4.00
500	5" Round	5.00
505	6" Round	6.00
501	4"x6" Oval	6.00
503	5"x7" Oval	8.00
504	5"x7" Square	10.00
526	5" Round Fender	5.00
527	Octagon	6.00
528	Octagon Fender	6.00
529	Packard Bezel	6.00
531	Mercer Shield	7.00
532	Cadillac Shield	6.00

Stock finishes—black or black and nickel. All nickel or all brass will be furnished if desired. We also make a special mirroscope for Ford cars.

These are genuine Mirroscopes. Others are imitations.

THE J. ALEXANDER MANUFACTURING COMPANY, Inc.
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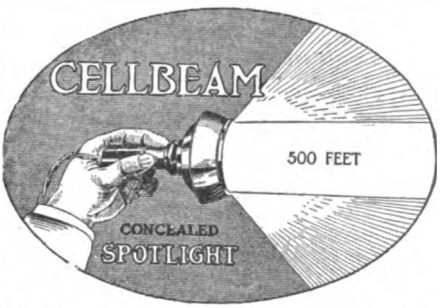

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You might call it "the light of a 1,000 uses"—because it can be used wherever a light is needed around a car.

It can be used as a windshield spotlight—a trouble lamp—and as an aid to night tire trouble—nothing has ever been invented to equal it. It can be used under the car, over the car and on both sides of the car.

A Cell-Beam spotlight should be a part of every car's "emergency equipment." To drive a car at night without a Cell-Beam is like touring without an extra tire—you may never need it, but when you do you need it badly.

The Cell-Beam projects a brilliant beam of light a distance of 500 feet and at the same time objects close at hand are illuminated by a "non-glare" general illumination.

Retails for $5. Price to dealers $3.50. Extra Bulbs 55c. each.

Order through your jobber or write us direct.

CELL-BEAM MFG. CO.
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MACHINERY: *New and Second Hand*

Complete stock of lathes, shapers, planers, milling machines, drill presses, bolt machines, etc. Large stock of carbon and high-speed steel drills in taper shank, straight shank, wire gauge and prentice sizes.

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MIXERS, ECONOMIZERS or AGITATORS and AUXILIARY AIR VALVES (Continued)

Par-Kop Mfg. Co., 1522-24 Ingersoll St., Philadelphia, Pa. "Parker."
Parker—See Par-Kop Mfg. Co.
Patterson, F. W., 836 E. 43d St, Chicago, Ill. "Kero-mix."
Peck, E. C., 482 Third St., San Bernardino, Cal.
Perpetual—See Ratliff, Sidney A.
Perrin Mfg. Co., Detroit, Mich.
Progressive Mfg. Co., 468 64th Ave., West Allis, Wis.
Radio—See Elder Mfg. Co.
Ratliff, Sidney A., Main St., Riverside, Cal. "Perpetual."
Reflex Ignition Co., 1710 Payne Ave., Cleveland, O. (See page 595.)
Right Motor Specialties Co., 1326 Michigan Ave., Chicago, Ill.
Royal-Silent Motor Co., Los Angeles, Cal.
Russell Electric Co., 30 Rowan St., Danbury, Conn.
Savage Tire Co., Main & Sicard Sts., San Diego, Cal. "Thurston."
Schaefer Bros., 1059 W. 11th St., Chicago, Ill. "Vigor."
Sly—See Hine-Watt Mfg. Co.
Speedler—See Lydon Mfg. Co.
Stanley—See Deppe, W. P.
Star Generator Co., Logansport, Ind.
Stewart Machine Works, Alfred C., Tenth & Santee Sts., Los Angeles, Cal.
Superfector—See Hard Mfg. Co.
Taylor Mfg. Co., 28 Lasher Ave., Redford, Mich.
Thurston—See Savage Tire Co.
V Air Valve & Mfg. Co., 1648 Tremont St., Denver, Colo.
Vigor—See Schaefer Bros.
Votalizer—See Flintham & Gilstrap Co.
Ware Bros., 224 N. Ada St., Chicago, Ill. "Aer-In."
Warren, Jno. W., San Antonio, Tex.
Wilson Vaporizer Co., Roslyn, Pa.
Wizard Gasaver Co., Mercantile Bldg., Rochester, N. Y.

MIXERS, ECONOMIZERS or AGITATORS and AUXILIARY AIR VALVES, for Fords

(See also Heaters, Mixture; also Primers, Engine)

Albrecht-Ingraham Co., 303 S. Third St., Minneapolis, Minn.
Aristos Co., Warren, O. "Economy."
Automatic Carburetor Co., 1422 Bryan Pl., Chicago, Ill.
Bell Gasoline Saver Co., 1909 Pennsylvania Ave., N. W., Washington, D. C.
Boucher, Geo. S., Damascus, Va.
Burnox Co., 6324 Greenfield Ave. (W. Allis), Milwaukee, Wis. "Hunt."
Clemmer, G. H., West Alexandria, O.
Crone, F. G., 334 Genesee St., Buffalo, N. Y.
Economy—See Aristos Co.
Edelmann & Co., E., 341-63 E. Ohio St., Chicago, Ill. "Jumbo."
Eureka Parts Co., 328 Central Ave., Dunkirk, N. Y.
Foot Air Accelerator Co., Union Central Bldg., Cincinnati, O.
"Go" Motor-Speeder Co., 165 Third Ave., Three Rivers, Mich.
Grace & Co., 3205 W. Washington St., Los Angeles, Cal.
H-I-S-C-O—See Hinton Sales Co.
H. & G.—See Riverside Specialty Co.
Hinton Sales Co., Story Bldg., Los Angeles, Cal. "H-I-S-C-O."
Hoosier Sub-Carburetor Co., 309 N. Illinois St., Indianapolis, Ind.
Hub Auto Specialties Co., 100 Arlington Ave., Charlestown, Mass.
Hudson Motor Specialties Co., 1932 Arch St., Philadelphia, Pa.
Hunt—See Burnox Co.
Jumbo—See Edelmann & Co.
National Motor Supply Co., Painesville, O.
New York Coil Co., 338-40 Pearl St., New York, N. Y.
Nu-Wae—See Relax Co.
Par Kop Mfg. Co., 1522-24 Ingersoll St., Philadelphia, Pa. "Parker."
Parker—See Par Kop Mfg. Co.
Perfection Auto Parts Co., 404 Lakeside Ave., N. W., Cleveland, O. "Ritemix." (See page 493.)
Relax Co., Norwood, O. "Nu Wae."
Remington Mfg. Co., 521 Market St., Philadelphia, Pa.
Ritemix—See Perfection Auto Parts Co.
Riverside Specialty Co., Riverside, Cal. "H. & G."
Roper & Co., C. F., Hopedale, Mass.
Russell Electric Co., 30 Rowan St., Danbury, Conn.
Stransky Mfg. Co., Pukwana, S. Dak.
Vetter, W. G., 316 Flyn St., Alva, Okla.

MIXING VALVES—See Vaporizers

MIXTURE HEATERS—See Heaters, Mixture

MOHAIR CLOTH—See Cloth, Mohair

MOHAIR TOP DRESSING—See Dressing, Mohair Top

MOISTENERS, Air or Mixture

(For feeding water into the intake manifold)

Acme Co., 90 W. Broadway, New York, N. Y. "Royal."
Aderholdt Mfg. Co., 1528 Broadway, Denver, Colo.
American—See Duffy-Downey Co.
American Auto Products Co., 240-44 S. Broadway, Denver, Colo. "Dietz."
Atlas Auto Specialties Corp., 51 W. 66th St., New York, N. Y. "Ged."
Automatic Carbon Eliminator Co., 2010 Broadway, New York, N. Y.
Burnell Mfg. Co., 536 E. Water St., Milwaukee, Wis.
Carbon Destroyer Corp., 486 Broadway, New York, N. Y. "No Nox."
Casey Asco Mfg. Co., 1504 Grand Ave., Kansas City, Mo. "Dubiservis."
Comfort Motor Machine Co., 715 Galapage St., Denver, Colo.
Darling, Len H., W. P. Story Bldg., Los Angeles, Cal.
Dietz—See American Auto Products Co.
Dubiservis—See Casey Asco Mfg. Co.
Duffy-Downey Co., 1003 Rush St., Chicago, Ill. "American."
Esta Co., 107 Massachusetts Ave., Boston, Mass.
Fogger—See Motor-Steam Generator Co.
Gas-E-Co.—See Gasoline Economy Co.

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NEW YORK CITY

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ALSO OTHER
NON-FERROUS METALS

COPPER
In
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THE ECONOMY VAPOR PLUG

makes any carburetor 100% more efficient. It gives the motor that much needed "extra air" at increased speed—thus producing a leaner mixture as the speed of the motor increases. This means perfect combustion—and perfect combustion means no waste of fuel—more miles per gallon of gas—and no accumulation of carbon.

Dealers Write For Further Details

Every motorist who comes into your place has a use for one of these "Vapor Plugs"—and so is a prospective customer. He is only waiting for you to tell him why he needs a "Vapor Plug"—how it will keep carbon out of his motor—and how it will help him to get every ounce of power out of his gasoline.

The Vapor Plug retails for $3.50 with a good discount to dealers.

"Sold Through the Trade Only"

THE ARISTOS COMPANY, Warren, Ohio

MP Cables

THE best insurance against electrical difficulties is to have the job wired with MP cables.

MP Cables and assemblies for all automotive electrical work, including

MP Ford Assemblies
Made to Ford Specifications

can be secured from stock. Prompt shipments made anywhere. Write for prices.

Motor Parts Company
843 North Broad Street,
Philadelphia, Pa.
New York Boston Buffalo Springfield

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MOISTENERS, Air or Mixture (Continued)

Gasoline Economy Co., Colonial Trust Bldg., Philadelphia, Pa. "Gas-E-Co."
Ged—See Atlas Auto Specialties Corp.
Gemco Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. (See page 135.)
Grelco—See Grothe Electric Co.
Grothe Electric Co., 822 Jefferson St., Burlington, Ia. "Grelco."
Hollowell Bros., 329 W. Pico St., Los Angeles, Cal.
Hart-Bell Co., 1926 Broadway, New York, N. Y.
Hydro-Carbon Preventive Co., 3029 Third Ave., New York, N. Y.
Hydro-Eye Co., 332 W. 70th St., New York, N. Y.
Hydrovaporizer—See Accessory Mfg. Sales Co.
J-M Oxygenerator Co., 1929 E. 40th St., Cleveland, O.
Lake Sales Co., 1947 Broadway, New York, N. Y. "Lasco." (See page 591.)
Lasco—See Lake Sales Co.
Manufacturers Distributing Co., Seventh & Pine Sts., St. Louis, Mo. "Wegemann."
Motor-Steam Generator Co., Heed Bldg., Philadelphia, Pa. "Fogger."
No Nox—See Carbon Destroyer Corp.
Popp Mfg. Co., M. L., 343-45 33d Ave., Milwaukee, Wis.
Redee Mfg. Corp., Minneapolis, Minn.
Royal—See Acme Co.
S & H Mfg. Co., Palace Bldg., Minneapolis, Minn.
Steel Products Co., Rice Lake, Wis. "Vapogas."
Strasburg Mfg. Co., J. L., Albert Lea, Minn.
Till, William F., 150 Nassau St., New York, N. Y. "Vapor-Humidifier."
United Mfg. Co., 613 E. 28th St., Minneapolis, Minn.
Valhalla Products Co., 1215 Carmen Ave., Chicago, Ill.
Vapogas—See Steel Products Co.
Vapor-Humidifier—See Till, William F.
Vapor Inspirator Co., 1225 W. Tenth St., Kansas City, Mo.
Water Gas Carburetor Co., 1504 Grand Ave., Kansas City, Mo.
Wegmann—See Manufacturers Distributing Co.
Whitney Mfg. Co., R. S., Lewiston, Me.

MOISTENERS, Air or Mixture, for Fords

(For feeding water into the intake manifold)

American Auto Products Co., 240-44 S. Broadway, Denver, Colo. "Dietz."
De-Carbo—See Hastings Mfg. Co.
Dietz—See American Auto Products Co.
Fogger—See Motor-Steam Generator Co.
Friestedt Mfg. Co., 2928-32 W. Lake St., Chicago, Ill. "Hydronizer."
Gas-E-Co.—See Gasoline Economy Co.
Gasoline Economy Co., Colonial Trust Bldg., Philadelphia, Pa. "Gas-E-Co."
Gemco Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. (See page 135.)
Hastings Mfg. Co., Hastings, Mich. "De-Carbo."
Hayes-Ederholdt Mfg. Co., Denver, Colo.
Hiatt Manifold Co., Indianapolis, Ind.
Hydronizer—See Friestedt Mfg. Co.
J-M Oxygenerator Co., 1929 E. 40th St., Cleveland, O.
Motor-Steam Generator Co., Heed Bldg., Philadelphia, Pa. "Fogger."
Smith, Fred, West Park Pl., Stamford, Conn.
Till, Wm. F., 150 Nassau St., New York, N. Y.

MOLDED INSULATION—See Composition, Insulating

MOLDS, Lead

(Molds for forming burning lead from scrap)

American Bureau of Engineering, 1018 S. Wabash Ave., Chicago, Ill. "Peers." (See page 855.)
Peers—See American Bureau of Engineering.

MOLDS and CORES, Tire Vulcanizing

Akron Rubber Mold & Machine Co., 917 Sweitzer Ave., Akron, O.
Altenburg Tire Equipment Co., 1223-27 E. River St., Davenport, Ia.
Bridgewater Machine Co., 31-37 Cherry St., Akron, O.
Claflin Engineering Co., Lancaster, O.
Jones & Kuhlke, 48-58 W. Exchange St., Akron, O.
Miller, Chas E., Anderson, Ind.
Milwaukee Auto Specialty Co., 705-15 Chestnut St., Milwaukee, Wis.
Thropp's Sons Co., John E., Trenton, N. J.
Williams Foundry & Machine Co., 100 Walnut St., Akron, O. (See page 733.)

MONKEY WRENCHES—See Wrenches, Nut and Bolt

MONOGRAM PLATES—See Plates, Robe Monogram or Initial

MONOGRAMS, Ornamental Metal

Autograms—See Wood-Detroit Mfg. Co.
Balzer Co., Gus, New York American Bldg. New York, N. Y.
Bernard Co., J., 422-30 E. 53d St., New York, N. Y.
Colgan Co., J. W., Sudbury Bldg., Boston, Mass.
Creutz Plating Co., Fifth & Elm Sts., Cincinnati, O.
Crowe Name Plate & Engraving Co., Chicago, Ill. (See page 461.)
Fine Co., Horace E., 19 E. State St., Trenton, N. J.
Greenduck Co., Van Buren & Hoyne Aves., Chicago, Ill.
Handel Co., Louis, 138 Center St., New York, N. Y.
Hanson Co., C. H., 173 N. Clark St., Chicago, Ill.
Hicock Mfg. Co., 39 N. Water St., Rochester, N. Y.
Imperial Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill. (See page 733.)
Johnston Co., J. G., 79 Sudbury St., Boston, Mass.
Matthews & Co., Jas. H., Pennant Way, Pittsburgh, Pa.
Murdock, Jr. Co., James, 116 Opera Pl., Cincinnati, O.

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PERU AUTO PARTS MFG. CO.

Manufacturers of

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Front and Rear Axles

PERU, IND.

Western Motor Supply Co.

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Bosch Magnetos
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Tuthill Titanic Springs
U-S-L Storage Batteries
Gabriel Rebound Snubbers
Veedol Lubricants
Heinze Springfield Ford Starters
Raybestos Brake Lining
Leak Proof Piston Rings
Boyce Motometer
U. S. Bearings
Efficiency Dry Cells
Edison Mazda Lamps
Grinnell Gloves
Weed Tire Chains
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A COMPLETE LINE OF THE VARIOUS MAKES OF

Speedometers
Lamps
Auto Coats
Auto Robes
Tire Covers
Tire Pressure Gauges
Oils and Greases
Body and Metal Polish
Jacks
Pumps
Batteries, Dry and Storage
Cements
Tools
Funnels and Measures
Spark Plugs, etc., etc.

We have an equipment of the latest design for charging and repairing storage batteries.

We have a complete Magneto and Electric Starter Repair Plant and are able to give prompt and efficient service for all makes of Magnetos and Starters.

NAME PLATES FOR AUTOMOBILES

ACCESSORIES, MACHINERY, ETC.

ETCHED SILL AND DASH PLATES

SKELETON RADIATOR

LIGHT METAL STAMPING AND FORMING

LET US FIGURE ON YOUR REQUIREMENTS

WE SUBMIT DESIGNS & SAMPLES

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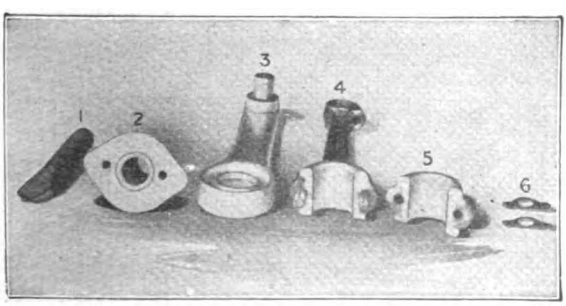
PROMPT DELIVERIES

Crewe Name Plate and Engraving Co. Chicago



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Patented March 12, 1918

Will quickly and cheaply replace the worn babbitt connecting rod bearings in Ford engines. Price to dealers $2.85 each.

SPECIAL PROPOSITION TO WHOLESALERS AND JOBBERS

Hanten Machine Company
Manufacturers
Watertown. S. D.

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MONOGRAMS, Ornamental Metal (Continued)

New York Stencil Works, 100 Nassau St., New York, N. Y.
Salman, John A., 17-21 Bromfield St., Boston, Mass.
Schridde, Wm., 35 S. Clark St., Chicago, Ill.
Schwerdtle Stamp Co., 39-41 Cannon St., Bridgeport, Conn.
Stafford Co., N., 67 Fulton St., New York, N. Y.
Walter & Sons, N. C., 3 Park Row, New York, N. Y.
Whiteford & Co., Jos. G., 165 N. Jefferson St., Chicago, Ill.
Wood-Detroit Mfg. Co., Marquette Bldg., Detroit, Mich. "Autograms."

MONOGRAMS, RADIATOR—See Monograms, Ornamental

MORTISING MACHINES—See Machines, Wood Mortising

MOSS, Upholstery

(For use instead of Hair; for Hair—See Hair, Upholstery; for Upholstery, Felt—See Felt Upholstery)

Babin, Luke B., White Castle, La.
Kohlmann Moss & Cotton Felt Mfg. Co., 1224-30 St. Thomas St., New Orleans, La.
Landers Bros. Co., Blucher & Buckingham St., Toledo, O.
Sutherland Co., F. L., 139 Beaubien St., Detroit, Mich. (See page 523.)
Woll & Sons Mfg. Co., Peter, Hancock & Berks Sts., Philadelphia, Pa.

MOTION RECORDERS—See Recorders, Vehicle

MOTOR BOATS—See Section I

MOTOR COMMUTATORS—See Commutators, Electric Motor

MOTOR CONTROLLERS—See Controllers, Electric Motor

MOTOR DECARBONIZING MACHINES—See Machines, Motor Decarbonizing

MOTOR GENERATORS—See Dynamos, and Motor Generators

MOTOR HOODS—See Hoods, Motor

MOTOR REPAIR STANDS—See Stands, Motor Repair

MOTOR TESTING INSTRUMENTS—See Instruments, Motor Testing

MOTOR TRUCKS—See Section I

MOTOR WHEELS—See Wheels, Motorcycle Motor

MOTORCYCLES—See Section I

MOTORS, Aircraft Gasoline

Ashmusen Mfg. Co., 266 Pearl St., Providence, R. I.
Brennen Motor Mfg. Co., 103 Grape St., Syracuse, N. Y.
Curtiss Aeroplane & Motor Corp., 2000 Elmwood Ave., Buffalo, N. Y.
Duesenberg Motor Corp., 120 Broadway, New York, N. Y.
Hall-Scott Motor Car Co., Crocker Bldg., San Francisco, Cal.
Hispano-Suiza—See Wright-Martin Aircraft Corp.
Hudson—See Western Aero Motor Co.
Kessler Motor Co., 276-77 Vanilla Ave., Detroit, Mich.
Lincoln Motor Co., Detroit, Mich.
Miller Mfg. Co., Harry A., 219 E. Washington St., Los Angeles, Cal.
Regal Gasoline Engine Co., 59 W. Pearl St., Coldwater, Mich.
Roberts Motor Mfg. Co., Sandusky, O.
Rolls-Royce, Ltd., 15 Broad St., New York, N. Y. (Importers.)
Sturtevant Aeroplane Co., William St. (Jamaica Plain), Boston, Mass.
Thomas-Morse Aircraft Co., Ithaca, N. Y.
Tips Aero Motor Co., rear 292 E. School St., Woonsocket, R. I.
Trego Motors Corp., Fox & Ferry Sts., New Haven, Conn.
Union Gas Engine Co., Kennedy & Boehmer Sts., Oakland, Cal.
Wisconsin Motor Mfg. Co., Dept. 324, Milwaukee, Wis. (See page 469.)
Wright-Martin Aircraft Corp., New Brunswick, N. J. "Hispano-Suiza."

MOTORS, Electric Automobile

Diehl Mfg. Co., Elizabethport, N. J.
General Electric Co., Schenectady, N. Y. (See pages 564 and 565.)
Wagner Electric Mfg. Co., 6400 Plymouth Ave., St. Louis, Mo.
Westinghouse Electric & Mfg. Co., 110-14 W. 42nd St., New York, N. Y. (See page 667.)

MOTORS, Gasoline Automobile

A. B. R. Motor & Engineering Co., Stamford, Conn. (See page 467.)
Able Engine Co., Peekskill, N. Y.
Amalgamated Engine Co., Chicago, Ill. (See page 469.)
Automatic Machine Co., 113 E. Washington Ave., Bridgeport, Conn.
Avery Co. Motor Works, 57th Ave. & Mitchell St. (W. Allis), Milwaukee, Wis.
Beaver Mfg. Co., First St. & Oklahoma Ave., Milwaukee, Wis.
Bradley-Ellis Motor Co., 15000 Columbia Ave., Harvey, Ill.
Brennan Motor Mfg. Co., 103 Grape St., Syracuse, N. Y.
Buda Co., Harvey, Ill. (See page 467.)
Buffalo Gasoline Motor Co., 1280-90 Niagara St., Buffalo, N. Y.
C. A. S. Engineering Co., 790 Woodward Ave., Detroit, Mich. (Sole Distributors for H. J. Walker Co., Cleveland, O.
Carson Motor Co., 519 Hillger Ave., Detroit, Mich.
Champion Mfg. Co., 7332-48 Kimbark Ave., Chicago, Ill.
Climax Engineering Co., 1800 Fourth St., Clinton, Ia.
Continental Motors Corp., Detroit, Mich. (See page 410.)
Doman Co., H. C., Fifth St., Oshkosh, Wis.
Duesenberg Motor Corp., 120 Broadway, New York, N. Y.

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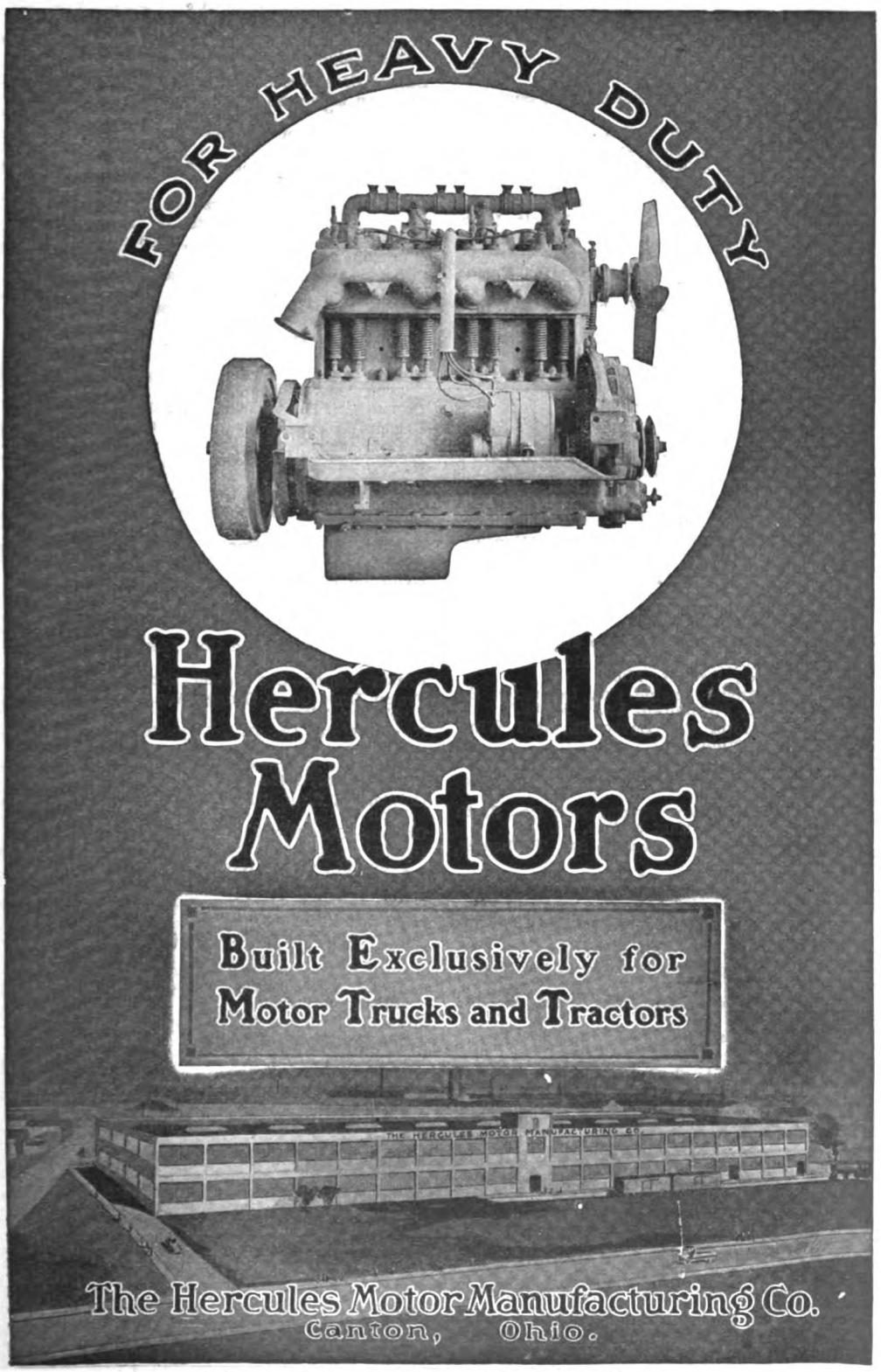

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MOTORS, Gasoline Automobile (Continued)

Elbridge Engine Co., 328 Main St., E., Rochester, N. Y.
Erd Motor Co., 300-04 Mackinaw St., Saginaw, Mich.
Ergon—See Russell, F. Dean.
Falls Motors Corp., Sheboygan Falls, Wis.
Golden, Belknap & Swartz Co., 1248-60 Grand River Ave., Detroit, Mich.
Gould Motor & Mfg. Co., Marion, Ind.
Gray Motor Co., Conners Lane, Detroit, Mich.
Hercules Motor Mfg. Co., Canton, O. (See page 463.)
Herschell-Spillman Co., North Tonawanda, N. Y. (See page 287.)
Hinkley Motors Corp., W. Fort & 23d Sts., Detroit, Mich.
Keystone Motor Mfg. Co., East Greenville, Pa. "Yokum."
Lawrence-Lewis Aeroplane Co., Peoples Gas Bldg., Chicago, Ill.
Le Roi Co., Milwaukee, Wis. (See page 475.)
Lewis Motor Corp., Detroit, Mich.
Light Mfg. & Foundry Co., Pottstown, Pa.
Lycoming Foundry & Machine Co., Williamsport, Pa.
Miller Mfg. Co., Harry A., 219 E. Washington St., Los Angeles, Cal.
Minneapolis Steel & Machinery Co., Minneapolis, Minn. "Twin City."
Model—See Pittsburgh Model Engine Co.
Niagara Motors Corp., Liberty Bldg., Buffalo, N. Y.
North American Motors Co., Queen St., Pottstown, Pa. (See page 469.)
Northway Motor & Mfg. Co., 510-14 Maybury Grand Ave., Detroit, Mich.
Pittsburgh Model Engine Co., Lexington St. & P. R. R., Pittsburgh, Pa. "Model."
Red Wing Motor Co., Levee St., Red Wing, Minn. "Thorobred."
Reliable Engine Co., Portsmouth, O.
Rochester Motors Co., 634 Lexington Ave., Rochester, N. Y.
Root & Van Dervoort Engineering Co., Sixth St. & 13th Ave., East Moline, Ill.
Russell, F. Dean, Schearer St., Rochester, N. Y. "Ergon."
Rutenber Motor Co., Marion, Ind. (See page 467.)
Supreme Motors Corp., Ashtabula, O.
Teetor-Hartley Motor Co., Hagerstown, Ind.
Thorobred—See Red Wing Motor Co.
Torro Motor Co., 3042 Snelling Ave., Minneapolis, Minn.
Twin City—See Minneapolis Steel & Machinery Co.
Universal Motor Co., 39 Ceape St., Oshkosh, Wis.
Walker Co.—See C. A. S. Sales Co.
Waukesha Motor Co., Waukesha, Wis. (See page 465.)
Weidely Motors Co., Georgia & Shelby Sts., Indianapolis, Ind.
Wilcox Motor & Mfg. Co., Saginaw, Mich. (See page 585.)
Wisconsin Motor Mfg. Co., Dept. 324, Milwaukee, Wis. (See page 469.)
Yokum—See Keystone Motor Mfg. Co.

MOTORS, Motor Boat Gasoline

Acme Engine Co., 11 Minna St., San Francisco, Cal.
Airdrive—See Kemp Machine Works.
Alford Motor & Machine Co., Ninth & Lincoln Sts., Goshen, Ind. "Goshen."
Anderson Engine Co., 4038 N. Rockwell St., Chicago, Ill.
Automatic Machine Co., 113 E. Washington St., Bridgeport, Conn. "Snapper."
Barber Bros., 500 E. Water St., Syracuse, N. Y.
Brennan Motor Mfg. Co., 103 Grape St., Syracuse, N. Y.
Bridgeport Motor Co., 105 Kossuth St., Bridgeport, Conn.
Buffalo Gasolene Motor Co., 1280-90 Niagara St., Buffalo, N. Y.
C-O—See Fairbanks-Morse & Co.
Cady Co., C. N., Canastota, N. Y.
Caille Perfection Motor Co., 1300 Second Ave., Detroit, Mich.
Camden Anchor-Rockland Machine Co., Camden, Me. "Knox."
Carson Motor Co., 519 Hillger Ave., Detroit, Mich.
Clay Engine Mfg. Co., 864 E. 72d St., Cleveland, O. "Honest Clay."
Curtiss Aeroplane & Motor Corp., 2000 Elmwood Ave., Buffalo, N. Y.
Doman Co., H. C., Fifth St., Oshkosh, Wis.
Driggs Ordnance Co., 120 Broadway, New York, N. Y.
Duesenberg Motor Corp., 120 Broadway, New York, N. Y.
Dunn Motor Works, Ogdensburg, N. Y.
Erd Motor Co., 300-04 Mackinaw St., Saginaw, Mich.
Evansville Gas & Engine Works, 1230 Riverside Ave., Evansville, Ind.
Evinrude Motor Co., 279 Walker St., Milwaukee, Wis.
Fairbanks-Morse & Co., 900 S. Wabash Ave., Chicago, Ill. "C-O."
Fay & Bowen Engine Co., Lake St., Geneva, N. Y.
Frazer-Adams—See Frazer Bros. Co.
Frazer Bros. Co., 1 Grange Ave., Adams, N. Y. "Frazer-Adams."
Frisbie Motor Co., 56 College St., Middletown, Conn.
Gas Engine & Power Co., & Chas. L. Seabury & Co., Morris Heights, N. Y. "Speedway."
Goldie, Jr., Wm., 611 E. Midland St., Bay City, Mich.
Goshen—See Alford Motor & Machine Co.
Grand Rapids Gas Engine & Yacht Co., 100 Front St., Grand Rapids, Mich. "Monarch."
Gray Motor Co., Conners Lane, Detroit, Mich.
Gray & Prior Machine Co., 32 Suffield St., Hartford, Conn.
Hettinger Engine Co., Grove & Henry Sts., Bridgeton, N. J.
Honest Clay—See Clay Engine Mfg. Co.
Johnson Machine Co., Carlyle, 52 Main St., Manchester, Conn.
John R. Gardner—See Lakeland Motor Works.
Jones Co., S. M., Toledo, O. "Ralaco."
Kahlenberg Bros. Co., 1705 12th St., Two Rivers, Wis.
Kemp Machine Works, 1215 S. Franklin St., Muncie, Ind. "Airdrive."
Kermath Mfg. Co., 115 E. Fort St., Detroit, Mich.
Knock-Down Motors, 253 Broadway, New York, N. Y. "Shipmate."
Knox Motors Co., 53 Wilbraham Rd., Springfield, Mass.
Lakeland Motors Works, Lakeland, Mich. "John R. Gardner."
Lathrop Co., J. W., Mystic, Conn.
Loane Engine Co., 306 Hanover St., Baltimore, Md.
Lockwood-Ash Motors Co., 1801 Horton St., Jackson, Mich.
Mianus Motor Works, McGee Ave., Stamford, Conn.

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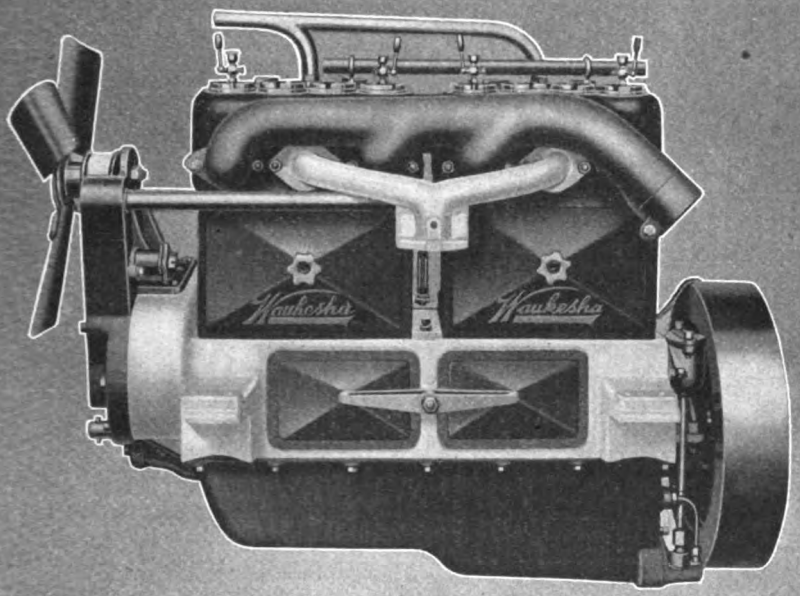

Patience Must Prevail

While the world is being righted for civilization all are called upon to do double duty. Each one must aid the government in every way, yet avoid slackening of production of the essentials of life. The builders of

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TRADE MARK

Four-Cylinder Motors for Trucks and Tractors

are endeavoring with might and main to produce their allotment of power plants for the government and at the same time serve the needs of truck and tractor builders. While it is impossible to furnish Waukesha motors to all who want them, facilities are being expanded at a rapid rate and no stone is being left unturned to make supply approximate demand.

"MY COUNTRY FIRST"

WAUKESHA MOTOR CO., Waukesha, Wis.

World's Largest Builders of Truck and Tractor Motors Exclusively

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MOTORS, Motor Boat Gasoline (Continued)

Mietz Corp., August, 128 Mott St., New York, N. Y.

Miller Engine Co., 2329-31 N. Talman Ave., Chicago, Ill.

Missouri Engine Co., 2806 N. 11th St., St. Louis, Mo.

Monarch—See Grand Rapids Gas Engine & Yacht Co.

Morton Motor Co., 46 Lafayette Ave., E., Detroit, Mich.

Murray & Tregurtha Co., 340 W. First St., Boston, Mass.

New York Yacht, Launch & Engine Co., Morris Heights, N. Y. "20th Century."

Niagara Motors Corp., 483 Ellicott St., Buffalo, N. Y.

Olin Gas Engine Co., 10-16 Lock St., Buffalo, N. Y.

Olmstead & Sons, A. E., Maple Ave., Pulaski, N. Y. "Ontario."

Ontario—See Olmstead & Sons.

Palmer Bros. Engine Co., Cos Cob, Conn.

Peerless Marine Motor Co., Buffalo, N. Y.

Ralaco—See Jones Co.

Red Wing Motor Co., Levee St., Red Wing, Minn. "Thorobred."

Regal Gasoline Engine Co., 59 W. Pearl St., Coldwater, Mich.

Roberts Motor Mfg. Co., Sandusky, O.

Root & Van Dervoort Engineering Co., Sixth St. & 13th Ave., East Moline, Ill.

Salter Motor Mfg. Co., 1516-18 Oakland Ave., Kansas City, Mo.

Scripps Motor Co., 629-32 Lincoln Ave., Detroit, Mich. "Thorobred."

Shipmate—See Knock-Down Motors.

Sieverkropp Engine Co., 1402 19th St., Racine, Wis. (See page 653.)

Snapper—See Automatic Machine Co.

Speedway—See Gas Engine & Power Co., & Chas. L. Seabury & Co.

Standard Motor Construction Co., 172-80 Whiton St., Jersey City, N. J.

Standard Oil Engine Co., Woolworth Bldg., New York, N. Y.

Stanley Co., 48 Laring Ave., Salem, Mass.

Sterling Engine Co., 1280 Niagara St., Buffalo, N. Y.

Stork Motor Co., 1212 N. Niagara St., Saginaw, Mich.

Thorobred—See Red Wing Motor Co.

20th Century—See N. Y. Yacht, Launch & Engine Co.

Union Gas Engine Co., Kennedy & Boehmer Sts., Oakland, Cal.

Universal Motor Co., 39 Ceape St., Oshkosh, Wis.

Van Blerck Motor Co., Monroe, Mich.

Wisconsin Machinery & Mfg. Co., 51st & Burnham Sts., Milwaukee, Wis.

Wisconsin Motor Mfg. Co., Dept. 324, Milwaukee, Wis. (See page 469.)

Wolverine Motor Works, Union Ave., Bridgeport, Conn.

MOTORS, Motor Boat Kerosene, Crude Oil, etc.

Acme Engine Co., 11 Minna St., San Francisco, Cal.

Anderson Engine Co., 4036 N. Rockwell St., Chicago, Ill.

Baltimore Oil Engine Co., Baltimore, Md.

Buffalo Gasolene Motor Co., 1280-90 Niagara St., Buffalo, N. Y.

Burnoil Engine Co., 1108 S. High St., So. Bend, Ind.

Camden Anchor-Rockland Machine Co., Camden, Me.

Carl Engine Works, 103 N. Second St., Philadelphia, Pa.

Commonwealth Motors Co., 326 W. Madison St., Chicago, Ill. "Quayle."

Clay Engine Mfg. Co., 864 E. 72d St., Cleveland, O. "Honest Clay."

Craig Engine & Machine Works, James, 807 Garfield Blvd., Jersey City, N. J.

Dunn Motor Works, Ogdensburg, N. Y.

Grand Rapids Gas Engine & Yacht Co., 100 Front St., Grand Rapids, Mich. "Monarch."

Gray & Prior Machine Co., 32 Suffield St., Hartford, Conn.

Hatch Engine Co., 2-4 Stone St., New York, N. Y.

Harris Engine Co., Wilmington, Del.

Hitchcock—See Standard Oil Engine Co.

Honest Clay—See Clay Engine Mfg. Co.

Kahlenberg Bros. Co., 1705 12th St., Two Rivers, Wis.

Lathrop Co., J. W., Mystic, Conn.

Lazier Gas Engine Co., 190 Main St., Buffalo, N. Y.

Mianus Motor Works, McGee Ave., Stamford, Conn.

Miller Engine Co., 2329-31 N. Talman Ave., Chicago, Ill.

Missouri Engine Co., 2806 N. 11th St., St. Louis, Mo.

Monarch—See Grand Rapids Gas Engine & Yacht Co.

Nilson-Miller Co., 13th & Hudson Sts., Hoboken, N. J.

Olin Gas Engine Co., 10-16 Lock St., Buffalo, N. Y.

Quayle—See Commonwealth Motors Co.

Red Wing Motor Co., Levee St., Red Wing, Minn. "Thorobred."

Scripps Motor Co., 629-32 Lincoln Ave., Detroit, Mich. "Thorobred."

Standard Oil Engine Co., 130 Seaview Ave., Bridgeport, Conn. "Hitchcock."

Thorobred—See Red Wing Motor Co.

Union Gas Engine Co., Kennedy & Boehmer Sts., Oakland, Cal.

Wolverine Motor Works, Union Ave., Bridgeport, Conn.

Wright Machine Co., 321 E. Second St., Owensboro, Ky.

MOTORS, Motor Boat Outboard or Detachable

Arrow Motor & Machine Co., Newark, N. J. "Waterman Porta."

Caille Perfection Motor Co., 1300 Second Ave., Detroit, Mich.

Evinrude Motor Co., 279 Walker St., Milwaukee, Wis.

Koban Mfg. Co., 241 S. Water St., Milwaukee, Wis.

Lockwood-Ash Motor Co., 1801 Horton Ave., Jackson, Mich.

Waterman Porto—See Arrow Motor & Machine Co.

MOTORS, Motorcycle Gasoline

Spacke Machine & Tool Co., Indianapolis, Ind. (See page 427.)

MOTORS, Steam Automobile—See Engines, Steam

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THE RUTENBER MOTOR

A Powerful "Four"

Model 38 Standard type, 4-cylinder commercial motor, 40-50 H.P., 4⅛" bore by 5½" stroke. This motor is designed especially for heavy duty Trucks and Tractors. Capacities 2, 2½ and 3-ton.

The design of this motor is entirely modern and embodies the highest grade of material and workmanship. This motor can be furnished with standard S.A.E. bell-housing for unit type construction. Circulars will be mailed upon request.

RUTENBER MOTOR CO.

MARION, INDIANA

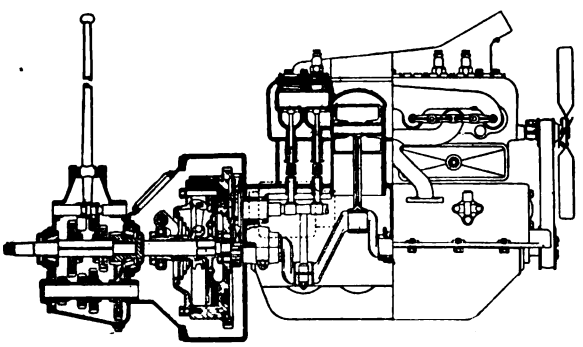
Pulling Power or Horse Power?

When an engine has the ability to pull hard at low speed it has torque—the power to turn itself against resistance—to pull to the last turn—something very different from horsepower.

Torque ordinarily is very low at low engine speeds, but the torque of the mighty BUDA ENGINE for TRUCKS and TRACTORS, is almost as great at its lowest as at its best speed.

Made by THE BUDA COMPANY
Harvey (Chicago Suburb), Ill.

THE BUDA ENGINE
"HIGH CLASS"



Motordom's Latest—

The A. B. R.

Unit Power Plant

A new but highly efficient power plant that is bound to become one of the most popular in the motor truck industry. Read over a part of the startling specifications:

30 H.P. (4 cylinders cast en bloc), 3¾ bore by 4" stroke.
3 speeds forward—2 reverse.
Non-adjustable Disc Clutch (own make).
Wright Tapered Roller Bearings.
Splash and Pump Lubrication System.

The complete A. B. R. Unit Power Plant includes spark plugs, wiring, generator and carburetor. Capacity production for 1918, 20,000 units. Write today for complete specifications and literature.

A. B. R. Motor & Engineering Co.

Stamford **Connecticut**

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MOTORS, Tractor Gasoline

Anderson Engine Co., 4036 N. Rockwell St., Chicago, Ill.

Automatic Machine Co., 113 E. Washington Ave., Bridgeport, Conn.

Beaver Mfg. Co., First St. & Oklahoma Ave., Milwaukee, Wis.

Bridgeport Motor Co., 105 Kossuth St., Bridgeport, Conn.

Buda Co., Harvey, Ill. (See page 467.)

Buffalo Gasolene Motor Co., 1280-90 Niagara St., Buffalo, N. Y.

Brennan Motor Mfg. Co., 103 Grape St., Syracuse, N. Y.

Chief Motor Co., Port Huron, Mich.

Doman & Co., H. C., Fifth St., Oshkosh, Wis.

Erd Motor Co., 300-04 Mackinaw St., Saginaw, Mich.

Field Motor Co., Turner Ave. & Ann St., Grand Rapids, Mich.

Flechter & Co., L. V., 198 Jackson Ave., Long Island City, N. Y. (See page 147.)

Hercules Motor Mfg. Co., Canton, O. (See page 463.)

Kermath Mfg. Co., 115 E. Fort St., Detroit, Mich.

Light Mfg. & Foundry Co., Pottstown, Pa.

Minneapolis Steel & Machinery Co., Minneapolis, Minn. "Twin City."

Niagara Motors Corp., 483 Ellicott Sq., Buffalo, N. Y.

North American Motors Co., Queen St., (See page 469.)

Pittsburgh Model Engine Co., Lexington St. & P. R. R., Pittsburgh, Pa.

Red Wing Motor Co., Levee St., Red Wing, Minn. "Thorobred."

Rutenber Motor Co., Marion, Ind. (See page 467.)

Scripps Motor Co., 629-32 Lincoln Ave., Detroit, Mich. "Thorobred."

Thorobred—See Red Wing Motor Co.

Thorobred—See Scripps Motor Co.

Torro Mfg. Co., 3042 Snelling Ave., Minneapolis, Minn.

Twin City—See Minneapolis Steel & Machinery Co.

Waukesha Motor Co., Waukesha, Wis. (See page 467.)

Weidely Motors Co., Georgia & Shelby Sts., Indianapolis, Ind.

Wisconsin Motor Mfg. Co., Dept. 324, Milwaukee, Wis. (See page 469.)

MOTORS, Tractor Kerosene

Anderson Engine Co., 4036 N. Rockwell St., Chicago, Ill.

Climax Engineering Co., 1800 Fourth St., Clinton, Ia.

Hatch Engine Co., 2-4 Stone St., New York, N. Y.

Minneapolis Steel & Machinery Co., Minneapolis, Minn. "Twin City."

Red Wing Motor Co., Levee St., Red Wing, Minn. "Thorobred."

Scripps Motor Co., 629-32 Lincoln Ave., Detroit, Mich. "Thorobred."

Thorobred—See Red Wing Motor Co.

Thorobred—See Scripps Motor Co.

Twin City—See Minneapolis Steel & Machinery Co.

MOULDING, BODY—See Mouldings, Brass; also Moulding, Steel

MOULDING, BRASS

Bridgeport Brass Co., E. Main St., Bridgeport, Conn.

Cowles & Co., C., New Haven, Conn. (See page 339.)

Dahlstrom Metallic Door Co., Buffalo & E. Second Sts., Jamestown, N. Y. (See page 731.)

Douglas & Lomason Co., 642 Lincoln Ave., Detroit, Mich.

Eastern Production Co., 137 Leib St., Detroit, Mich. (See page 345.)

English & Mersick Co., New Haven, Conn. (See page 573.)

Jonah & George, Merrimac, Mass.

Manhattan Brass Co., 328 E. 28th St., New York, N. Y.

Metal Stamping Co., 18th St. & Boulevard, Long Island City, N. Y.

Metropolitan Mfg. Co., Oakman Ave. & Detroit Terminal R.R., Detroit, Mich. (See page 641.)

Randolph-Clowes Co., Waterbury, Conn.

Rome Brass & Copper Co., Rome, N. Y

Smith & Co., Jos. N., E. Grand Blvd. & Dubois St., Detroit, Mich.

Solar Metal Products Co., 470 Starr Ave., Columbus, O.

White Mfg. Co., 155 Cannon St., Bridgeport, Conn.

Woodruff & Sons Co., Walter W., Mount Carmel, Conn.

MOULDING, Flexible Leather

Anchor—See Indianapolis Saddlery Co.

Indianapolis Saddlery Co., 237 S. Meridian St., Indianapolis, Ind. "Anchor."

MOULDING, Running Board

(See also Moulding, Brass; also Moulding, Steel)

Alite—See Zenite Metal Co.

Aluminum Co. of America, Pittsburgh, Pa.

Bridgeport Brass Co., E. Main St., Bridgeport, Conn.

Dahlstrom Metallic Door Co., Buffalo & E. Second Sts., Jamestown, N. Y. (See page 731.)

English & Mersick Co., New Haven, Conn. (See page 573.)

Kawneer Mfg. Co., Niles, Mich.

Metallic Automobile Matting Co., Rochester, N. Y. (See page 449.)

Metropolitan Mfg. Co., Oakman Ave. & Detroit Terminal R.R., Detroit, Mich. (See page 641.)

Smith & Co., Jos. N., E. Grand Blvd. & Dubois St., Detroit, Mich.

Waterbury Brass Goods Corp., 160 Washington Ave., Waterbury, Conn.

Woodruff & Sons Co., Walter W., Mount Carmel, Conn.

Zenite Metal Co., 201-05 N. West St., Indianapolis, Ind. "Alite." (See page 469.)

MOULDING, Steel

Dahlstrom Metallic Door Co., Buffalo & E. Second Sts., Jamestown, N. Y. (See page 731.)

MOULDINGS, Wood Door, for Fords—See Strips, Wood Door

MOVEMENT RECORDERS—See Recorders, Vehicle

MUD DEFLECTORS, for Fords—See Pans, Radiator Splash

MUD GUARD ANTI-RATTLERS, for Fords—See Braces, Mud Guard

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ZENITE METAL COMPANY

ALITE AND LEATHER MOULDINGS

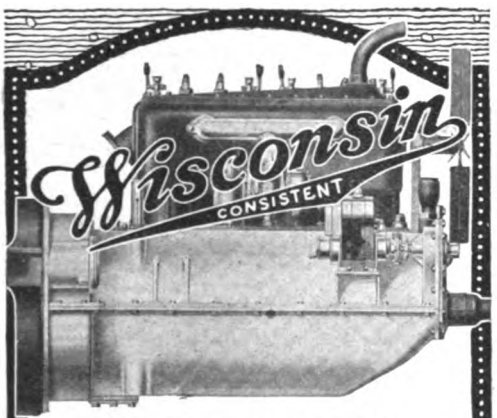
Stampings Windshields Die Castings

201-203-205 N. West St., Indianapolis

Duckwall Belting & Hose Co.

CLUTCH LEATHERS

201-203-205 N. West St. INDIANAPOLIS



IN ARMY SERVICE

On the battlefields of Europe and Asia, Wisconsin Motors are giving the same consistently dependable service that has made them champions of the world on road and speedway.

What better evidence could be had of their fitness for heavy truck service?

Truck models built in 4 and 6 cylinders.

Write today for specifications.

WISCONSIN MOTOR MFG. CO.

Dept. 324 Milwaukee, Wis.

New York Branch, 21 Park Row
T. M. FENNER
Factory Representative

AMALGAMATED MOTORS

Valve in the head *Overhead Cam*
Positive Control *Additional Power*

Amalgamated Engine Company, CHICAGO, ILL.

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MUD GUARD BRACES, for Fords—See Braces, Mud Guard

MUD GUARD CLAMPS, for Fords—See Braces, Mud Guard

MUD GUARD SILENCERS, for Fords—See Braces, Mud Guard

MUD GUARDS — See Fenders or Mud Guards

MUD HOOKS—See Chains or Grips, Non-Skid

MUFFLER CUT-OUT PEDALS—See Pedals, Horn

MUFFLER CUT-OUTS—See Valves, Muffler Cut-out

MUFFLER PAINTS—See Paints, Exhaust Pipe

MUFFLERS, Exhaust

A. Z. Co., 530 W. 50th St., New York, N. Y. (See page 563.)

Anti-Explo—See Gemco Mfg. Co.

Buffalo Metal Products Mfg. Co., 373-85 E. Delavan St., Buffalo, N. Y. "Multijector."

Buffalo Pressed Steel Co., Buffalo, N. Y. (See page 473.)

Cook Muffler Co., 162 N. Clinton St., Chicago, Ill.

Dunkirk Corp., 16 E. Second St., Dunkirk, N. Y. "Ejector."

Ejecto—See Dunkirk Corp.

Ever Clean—See Miller & Co.

G. P. & F.—See Geuder, Paeschke & Frey Co.

Gemco Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. "Anti-Explo." (See page 135.)

Geuder, Paeschke & Frey Co., 1422-1700 St. Paul Ave., Milwaukee, Wis. (See page 679.)

Gray-Hawley Mfg. Co., 937-43 Jefferson Ave., Detroit, Mich.

Kells Mfg. Co., W. J., 521-25 W. 45th St., New York, N. Y. (See page 575.)

Lawco—See Lawson Co.

Lawson Co., F. H., Dept. D., Cincinnati, O. "Lawco." (See page 663.)

Maxim—See Geuder, Paeschke & Frey Co.

Michigan Stamping Co., Mack Ave. & Detroit Terminal, Detroit, Mich.

Miller & Co., Spring Valley, Ill. "Ever Clean."

Mitchell & Son, G. F., 6501 Cedar Ave., Cleveland, O.

Multijector—See Buffalo Metal Products Mfg. Co.

Oldberg Mfg. Co., Detroit, Mich. (See page 471.)

Powell Muffler & Timer Co., 312-14 Catherine St., Utica, N. Y. (See page 473.)

Titeflex Metal Hose Corp., Badger Ave. & Runyon St., Newark, N. J. (See page 727.)

Troike Muffler & Mfg. Co., Lorain, O.

Vacuum Muffler Corp., 154 Nassau St., New York, N. Y. (See page 481.)

Xardell Bros. Co., 28 Broadway, Utica, N. Y.

Yankee Co., 69 Genesee St., Utica, N. Y.

MUFFLERS, Exhaust, for Fords

Buffalo Pressed Steel Co., Buffalo, N. Y. "Bupresco." (See page 473.)

Bupresco—See Buffalo Pressed Steel Co.

Dunco—See Dunkirk Corp.

Dunham Co., Thos., Aurora, Ill. (See page 75.)

Dunkirk Corp., 16 E. Second St., Dunkirk, N.Y. "Dunco."

Ever Clean—See Miller & Co.

Gemco Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. (See page 135.)

Geuder, Paeschke & Frey Co., 1422-1700 St. Paul Ave., Milwaukee, Wis. "Maxim." (See page 679.)

Gray-Hawley Mfg. Co., 937-43 Jefferson Ave., Detroit, Mich.

Greb Co., 195 State St., Boston, Mass. "Grebford." (See page 531.)

Grebford—See Greb Co.

Lawco—See Lawson Co.

Lawson Co., F. H., Dept. D, Cincinnati, O. "Lawco." (See page 663.)

Maxim—See Geuder, Paeschke & Frey Co.

Miller & Co., Spring Valley, Ill. "Ever Clean."

Oldberg Mfg. Co., Detroit, Mich. (See page 471.)

Perfection Auto Parts Co., 404 Lakeside Ave., N. W., Cleveland, O. (See page 493.)

Powell Muffler & Timer Co., 312-14 Catherine St., Utica, N. Y. (See page 473.)

Ritesize—See Yankee Co.

Titeflex Metal Hose Corp., Badger Ave. & Runyon St., Newark, N. J. (See page 727.)

Vacuum Muffler Corp., 154 Nassau St., New York, N. Y. (See page 481.)

Yankee Co., 69 Genesee St., Utica, N. Y. "Ritesize."

MUFFLERS, Motor Boat

(See also Boxes, Underwater Exhaust)

Buffalo Pressed Steel Co., Buffalo, N. Y. "Bupresco." (See page 473.)

Bupresco—See Buffalo Pressed Steel Co.

Central Mfg. Co., 155 Liverpool St., East Boston, Mass. "Thermex."

Dunco—See Dunkirk Corp.

Dunkirk Corp., 16 E. Second St., Dunkirk, N.Y. "Dunco."

Eisenbrandt, F. B., Light St., Baltimore, Md.

Gemco Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. (See page 135.)

Gray-Hawley Mfg. Co., 937-43 Jefferson Ave., Detroit, Mich.

Lawco—See Lawson Co.

Lawson Co., F. H., Dept. D, Cincinnati, O. "Lawco." (See page 663.)

Oldberg Mfg. Co., Detroit, Mich. (See page 471.)

Thermex—See Central Mfg. Co.

Vacuum Muffler Corp., 154 Nassau St., New York, N. Y. (See page 481.)

MUFFLERS, Motorcycle

Dunco—See Dunkirk Corp.

Dunkirk Corp., 16 E. Second St., Dunkirk, N.Y. "Dunco."

Geuder, Paeschke & Frey Co., 1422-1700 St. Paul Ave., Milwaukee, Wis. "Maxim." (See page 679.)

Gray-Hawley Mfg. Co., 937-43 Jefferson Ave., Detroit, Mich.

Lawco—See Lawson Co.

Lawson Co., F. H., Dept. D, Cincinnati, O. "Lawco." (See page 663.)

Maxim—See Geuder, Paeschke & Frey Co.

Oldberg Mfg. Co., Detroit, Mich. (See page 471.)

Vacuum Muffler Corp., 154 Nassau St., New York, N. Y. (See page 481.)

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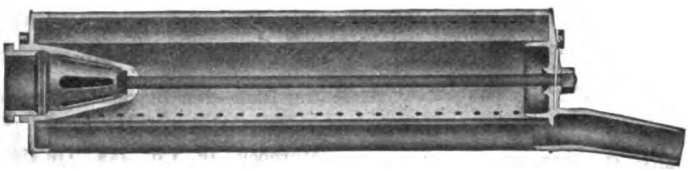
OLDBERG MUFFLERS



Interior Construction of Models "C", "D", "E", and "F"

Model "C"

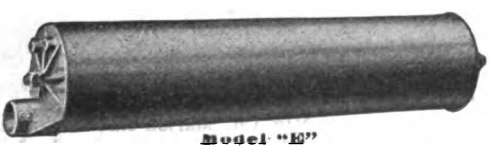
Model "C"

Outside diameter 4⅞". Length optional to 24". Tube sizes up to 2" O.D. Supplied with or without cut-out.

Model "D"

Outside diameter 5⅝". Length optional to 28". Tube sizes up to 2½" O. D. Supplied with or without cut-out.

Model "D"



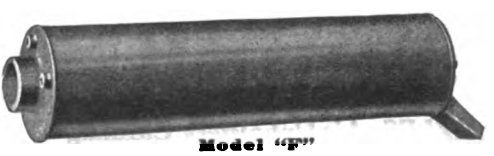
Model "E"

Model "E"

Outside diameter 6¾". Length optional to 30". Tube sizes to 2⅞" O./D. Supplied with or without cut-out.

Model "F"

Outside diameter 4". Length optional up to 24". Tube sizes up to 2" O.D. Not supplied with cut-out.



Model "F"

OLDBERG SPECIAL SERVICE

We can supply from stock any of our standard Oldberg models illustrated herewith, and can make up, to your order, any special exterior construction or fitting which may be necessary to mount our muffler in your chassis. The standard constructions shown completely cover all the sizes which will be required by either pleasure or commercial motor vehicle manufacturers. Free samples to manufacturers upon receipt of the size of motor and exhaust tube and whether or not cut-out is required. Write for specifications and quotations.

OLDBERG MANUFACTURING COMPANY

DETROIT, :: :: :: MICHIGAN

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MUFFLERS, Throat

(See also Clothing, Motorists)

Bradley Knitting Co., Delevan, Wis.

MUFFLERS, Tractor

Buffalo Gasolene Motor Co., 1280-90 Niagara St., Buffalo, N. Y.

Buffalo Pressed Steel Co., Buffalo, N. Y. "Bupresco." (See page 473.)

Bupresco—See Buffalo Pressed Steel Co.

Dunco—See Dunkirk Corp.

Dunkirk Corp., 16 E. Second St., Dunkirk, N.Y. "Dunco."

Gemco Mfg. Co., 666 S. Pierce St, Milwaukee, Wis. (See page 135.)

Geuder, Paeschke & Frey Co., Milwaukee, Wis. "Maxim." (See page 679.)

Gray-Hawley Mfg. Co., 937-43 Jefferson Ave., Detroit, Mich.

Maxim—See Geuder, Paeschke & Frey Co.

Oldberg Mfg. Co., Detroit, Mich. (See page 471.)

Powell Muffler & Timer Co., 312-14 Catherine St., Utica, N. Y. (See page 473.)

Vacuum Muffler Corp., 154 Nassau St., New York, N. Y. (See page 481.)

MULTIPLE SPINDLE DRILLS—See Drills, Multiple Spindle

NAILS, Upholstery—See Tacks, Upholstery

NAME PLATES—See Plates, Name

NATURAL LEATHER—See Leather, Natural

NEEDLE VALVES—See Valves, Needle

NICKEL STEEL—See Steel, Nickel

NIPPERS and WIRE CUTTERS—See Pliers, Combination

NIPPLES, PIPE—See Fittings, Pipe

NIPPLES, PUMP—See Connections, Tire Pump

NON-FREEZING COMPOUNDS—See Compounds, Anti-Freezing

NON-SKIDS, TIRE—See Bands, Non-Skid; also Chains or Grips; also Treads, Tire; also Boxes, Sand

NOZZLES, Air Upholstery Cleaning

Powell Co., Wm., 2525 Spring Grove Ave., Cincinnati, O. (See page 195.)

Romort Mfg. Co.—See Zinke Co.

Zinke Co., 1323-25 Michigan Ave., Chicago, Ill. (Sole Distributors for Romort Mfg. Co., Oakfield, Wis.) (See pages 548 and 549.)

NUMBER HOLDERS—See Holders, License

NUMBERS, Lamp

(Metal License Numbers for use in lamps on Busses or Cabs)

Balzer Co., Gus, New York American Bldg., New York, N. Y.

Fine Co., Horace E., 19 E State St., Trenton, N J.

NUMBERS or HANGERS, License

(For License Holders—See Holders, License)

Abbott Stamping Co., Dime Bank Bldg., Detroit, Mich.

Aluminum Goods Mfg. Co., Manitowoc, Wis.

Baltimore Enamel & Novelty Co., ft. Allen St., Baltimore, Md.

Balzer Co., Gus, New York American Bldg., New York, N. Y.

Enameled Steel Sign Co., 222 N. State St., Chicago, Ill.

Fine Co., Horace E., 19 E. State St., Trenton, N. J.

Ingram-Richardson Mfg. Co., Beaver Falls, Pa. "Ing-Rich."

Ing-Rich—See Ingram-Richardson Mfg. Co.

Limerick Co., J. Arthur, 960 N. Howard St., Baltimore, Md.

Murdock, Jr., Co., Jas., 116 Opera Pl., Cincinnati, O.

Niagara Falls Metal Stamping Works, 245 Tenth St., Niagara Falls, N. Y.

Royal Enameling & Mfg. Co., 326 W. Madison St., Chicago, Ill.

Sachs-Lawler Co., 1543 Lorimer St., Denver, Colo.

Shonk Co., Chas. W., Maywood, Ill.

Stafford Co., N., 67 Fulton St., New York, N. Y.

Stillman, A. P., 353 Jay St., Brooklyn, N. Y.

Whiteford & Co., Jos. G., 165 N. Jefferson St., Chicago, Ill.

NUMBERS, STEEL—See Stamps, Steel

NUT WRENCHES—See Wrenches, Nut and Bolt

NUTS, CASE HARDENED—See Nuts, Finished

NUTS, Castellated

American Iron & Steel Mfg. Co., Front & Cumberland Sts., Lebanon, Pa.

Barkelew Metal Products Co., 131 E. Second St., Dayton, O.

Brightman Mfg. Co., Marion Rd., Columbus, O.

Brightman Nut & Mfg. Co., Sandusky, O. (See page 475.)

Chicago Screw Co., Homan Ave. & Fillmore St., Chicago, Ill. (See pages 593 and 601.)

Cincinnati Screw Co., Twightwee, O.

Clark Bros. Bolt Co., Milldale, Conn.

Columbia Nut and Bolt Co., 1550 Railroad Ave., Bridgeport, Conn.

Crittenden Mfg. Co., Boston, Mass.

Detroit Bolt & Hardware Co., 45-49 Adelaide St., Detroit, Mich.

Detroit Screw Works, 368 Franklin St., Detroit, Mich.

Eberhard Mfg. Co., 2734 Tennyson Rd., Cleveland, O.

Garland Nut & Rivet Co., Bailey-Farrell Bldg., Pittsburgh, Pa.

Graham Nut Co., 1317-19 W. Carson St., Pittsburgh, Pa.

Hartford Machine Screw Co., Hartford, Conn. (See page 513.)

Hill Pump Valve Co.—See Zinke Co.

Milton Mfg. Co., Milton, Pa.

National Acme Co., Cleveland, O. (See page 477.)

National Bolt & Nut Co., Pittsburgh, Pa

National Lock Co., Rockford, Ill. (See page 599.)

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The Bupresco Silencer

EFFICIENT.

Designed to provide on a FORD MOTOR CAR the last degree of efficiency in minimizing BACK PRESSURE and MOTOR NOISES.

LIGHT and INDESTRUCTIBLE

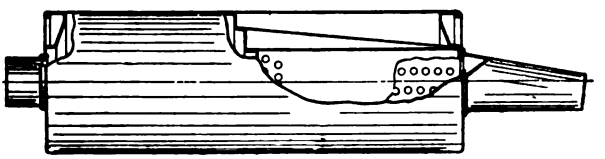
NO BOLTS—NO NUTS—NO RODS—NO CASTINGS to work loose from vibration.

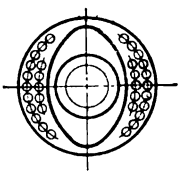
PRICE $2.50

with interchangeable Ford Brackets.

Write for special quantity prices to dealers.

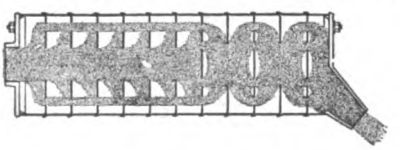
BUFFALO PRESSED STEEL COMPANY, BUFFALO, N. Y.





POWELL PRESSED STEEL MUFFLER

Adopted as Standard Equipment by 30 of the largest Automobile and Truck builders of America. The Powell Muffler will not blow up, leak or rattle. They are constructed of malleable iron heads and stamped steel sections, each section being a perforated cup. We have had mufflers in continuous use for over 10 years. We have many different styles and sizes in stock.



Powell Muffler & Timer Co., Inc.,

312-314 Catherine St., Utica, N. Y.

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NUTS, Castellated (Continued)

National Machine Products Co., Bellevue & Warren Sts., Detroit, Mich.
Phillips Mfg. Co., R. B., Worcester, Mass.
Rhode Island Tool Co., Providence, R. I.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.
St. Louis Screw Co., Clarence & Bulwer Aves., St. Louis, Mo.
Sherman-Klove Co., 4519 W. Harrison St., Chicago, Ill. (See page 603.)
Upson Nut Co., Unionville, Conn.
Western Automatic Machine Screw Co., 750 Lake Ave., Elyria, O. (See page 475.)
Western Screw-Products Co., St. Louis, Mo. (See page 593.)
Worcester Machine Screw Co., 79 Beacon St., Worcester, Mass.
Zinke Co., 1323-25 Michigan Ave., Chicago, Ill. (Sole Distributor for Hill Pump & Valve Co., Chicago, Ill.) (See page 551.)

NUTS, Finished and Case Hardened

American Iron & Steel Mfg. Co., Front & Cumberland Sts., Lebanon, Pa.
Atlas Bolt & Screw Co., 1289 Marquette Rd., N. E., Cleveland, O.
Barkelew Metal Products Co., 131 E. Second St., Dayton, O.
Brightman Mfg. Co., Marion Rd., Columbus, O.
Brightman Nut & Mfg. Co., Sandusky, O. (See page 475.)
Chicago Screw Co., Homan Ave. & Fillmore St., Chicago, Ill. (See pages 593 and 601.)
Cincinnati Screw Co., Twightwee, O.
Clark Bros. Bolt Co., Milldale, Conn.
Columbia Nut & Bolt Co., 1550 Railroad Ave., Bridgeport, Conn.
Columbus Bolt Works Co., Columbus, O. (See pages 187.)
Detroit Bolt & Hardware Co., 45-49 Adelaide St., Detroit, Mich.
Detroit Screw Works, 368 Franklin St., Detroit, Mich.
Foster Bolt & Nut Mfg. Co., Union Ave. & E. 72d St., Cleveland, O. "Perfection."
Garland Nut & Rivet Co., Bailey-Farrell Bldg., Pittsburgh, Pa.
Graham Nut Co., 1317-19 W. Carson St., Pittsburgh, Pa.
Hartford Machine Screw Co., Hartford, Conn. (See page 513.)
Haskell Mfg. Co., Wm. H., 24 Commerce St., Pawtucket, R. I.
Michigan Bolt & Nut Works, ft. Meldrum Ave., Detroit, Mich.
Milton Mfg. Co., Milton, Pa.
National Acme Co., Cleveland, O. (See page 477.)
National Bolt & Nut Co., Pittsburgh, Pa.
National Machine Products Co., Bellevue & Warren Sts., Detroit, Mich.
National Screw & Tack Co., Cleveland, O. (See page 477.)
Pawtucket Mfg. Co., 327 Pine St., Pawtucket, R. I.
Peninsular Milled Screw Co., 1090 Lafayette St., E., Detroit, Mich.
Perfection—See Foster Bolt & Nut Mfg. Co.
Pittsburgh Screw & Bolt Co., Preble Ave. (N. S.), Pittsburgh, Pa.
Reed & Prince Mfg. Co., Duncan Ave., Worcester, Mass.
Rhode Island Tool Co., Providence, R. I.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.
Sherman-Klove Co., 4519 W. Harrison St., Chicago, Ill. (See page 603.)
Western Automatic Machine Screw Co., 750 Lake Ave., Elyria, O. (See page 475.)

NUTS, HARDENED—See Nuts, Finished

NUTS and WASHERS, Lock

Absolute—See American Lock-Nut Co.
American Lock-Nut Co., 106th St. & Corliss Ave., Chicago, Ill. "Absolute."
American Nut & Bolt Fastener Co., Pittsburgh, Pa. "Bartley."
Bartley—See American Nut & Bolt Fastener Co.
Blair & Co., F. R., 50 Church St., New York, N. Y. "Loxon."
Cincinnati Screw Co., Twightwee, O.
Cincinnati Screw & Tap Co., 2442 Beekman St., Cincinnati, O.
Columbia Nut & Bolt Co., 1550 Railroad Ave., Bridgeport, Conn. "Gib."
Drake—See Western Screw & Lock Nut Co.
Gib—See Columbia Nut & Bolt Co.
Hidalgo Steel Co., 253 Broadway, New York, N. Y. "Shekleton."
Hobbs Mfg. Co., 26 Salesbury St., Worcester, Mass.
Holdfast Nut & Bolt Co., 134 S. La Salle St., Chicago, Ill.
Loxon—See Blair & Co.
Mansfield Lock Washer Co., 230 N. Adams St., Mansfield, O.
National Lock Washer Co., 65 Johnson St., Newark, N. J.
National Umbrella Frame Co.—See Tucker Tool & Machine Co.
Never Slip—See Tucker Tool & Machine Co.
O. K. Nut Lock Co., Turks Head Bldg., Providence, R. I.
Permanent Products Co., Engineers Bldg., Cleveland, O.
Positive Lock Washer Co., Newark, N. J. (See page 783.)
Quadriga Mfg. Co., 213-21 W. Grand Ave., Chicago, Ill.
Reliance Mfg. Co., Massillon, O. (See page 753.)
Roller Lock Nut Co., 61 Broadway, New York, N. Y.
Sailer & Melvin Mfg. Co., Massillon, O. (See page 753.)
St. Louis Screw Co., Clarence & Bulwer Aves., St. Louis, Mo.
Shekleton—See Hidalgo Steel Co.
Smith & Hemenway, 130 Colt St., Irvington, N. J.
Spring Nut Lock Co., Transportation Bldg., Chicago, Ill.
Torsion Nut-Lock & Washer Co., 141 Milk St., Boston, Mass.
Tucker Tool & Machine Co., 75 Murray St., New York, N. Y. (Sole distributors for National Umbrella Frame Co., Philadelphia, Pa. "Never Slip.") (See page 723.)
Western Screw & Lock Nut Co., Mills Bldg., San Francisco, Cal. "Drake."

NUTS, Thumb or Wing

Atlas Bolt & Screw Co., 1289 Marquette Rd., N. E., Cleveland, O.
Billings & Spencer Co., Laurel & Park Sts., Hartford, Conn.
Chicago Nut Co., 2513-39 W. 20th St., Chicago, Ill.
Chicago Screw Co., Homan Ave. & Fillmore St., Chicago, Ill. (See pages 593 and 601.)
Clark Bros. Bolt Co., Milldale, Conn.
Cleveland Wrought Products Co., 3590 W. 58th St., Cleveland, O.
Columbus Bolt Works Co., Columbus, O. (See page 187.)

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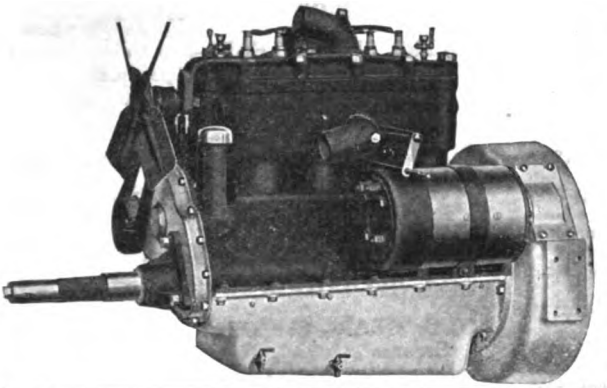

LeRoi Motor

3⅛x4½ Model C

FOR THE LIGHT TRUCK TOURING CAR OR ROADSTER

LeRoi Company

Milwaukee Wis.

Standard S.A.E. or A.L.A.M. Hexagon Plain & Castle Nuts

Carried in Stock

Large Quantities of sizes ranging from 1-4" to 1" inclusive which insures prompt delivery.

Our Nuts

Are turned from bar stock which has a tensile strength of 90,000 lbs. per square inch and an elastic limit of 75,000 lbs.

"Specials" made to "Order." Any piece from Iron, Steel, Brass or Bronze which can be turned in a screw machine.

"Western Service Book" mailed upon request.

The Western Automatic Machine Screw Co.

750 LAKE AVENUE, ELYRIA, OHIO

Detroit Sales Office: 1019 Dime Bank Bldg.

Established 1873

Cleveland Sales Office and Warehouse: 1224 West 6th St.

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Milled Steel Bar Nuts

U.S., A. L. A. M. or S. A. E. Standard. Finished, Semi-Finished and Castellated Nuts. Special Nuts of all kinds.

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SANDUSKY, OHIO

Manufacturers of Cold Drawn Hex Screw Stock
Detroit Office: 1512 Kresge Building, F. D. Ross, Rep.
Cincinnati Office: 500 Bell Block, A. T. Fisher, Rep.
San Francisco, Cal., The Bailey-Drake Co., Rep.
Chicago, Ill., W. A. Ahrens, 6618 Woodlawn
New York: 30 E. 42nd St., H. A. Steyn

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NUTS, Thumb or Wing (Continued)

Corbin Screw Corp., High St., New Britain, Conn.

Detroit Screw Works, 368 Franklin St., Detroit, Mich.

Devlin Mfg. Co., Thos., Third & Lehigh Aves., Philadelphia, Pa.

Eberhard Mfg. Co., 2734 Tennyson Rd., Cleveland, O.

Garland Nut & Rivet Co., Bailey-Farrell Bldg., Pittsburgh, Pa.

Haskell Mfg. Co., Wm. H., 24 Commerce St., Pawtucket, R. I.

Keeler Brass Co., 361-71 Godfrey Ave., Grand Rapids, Mich.

Peninsular Milled Screw Co., 1090 Lafayette St., E., Detroit, Mich.

Petry Co., N. A., 1309 Race St., Philadelphia, Pa.

St. Louis Screw Co., Clarence & Bulwer Aves., St. Louis, Mo.

Upson Nut Co., Unionville, Conn.

Western Automatic Machine Screw Co., 750 Lake Ave., Elyria, O. **(See page 475.)**

NUTS, WING—See Nuts, Thumb or Wing

ODOMETERS OR DISTANCE METERS—See Meters, Distance Recording

OIL CAN HOLDERS—See Holders, Oil Can; also Holders or Tippers, Oil Can

OIL CAN TIPPERS—See Holders or Tippers, Oil Can

OIL CANS—See Cans, Oiling, also Guns, Oil

OIL, Castor

A-A—See Baker Castor Oil Co.

Baker Castor Oil Co., 120 Broadway, New York, N. Y. "A-A."

OIL CLARIFIERS—See Separators, Oil

OIL COCK WRENCHES FOR FORDS—See Wrenches, Oil Cock

OIL CUPS—See Cups, Oil and Grease

OIL DEFLECTORS FOR FORDS—See Deflectors, Oil

OIL GAGES FOR FORDS—See Gages, Oil

OIL GUNS—See Guns, Oil

OIL HOLE COVERS—See Covers, Oil Hole

OIL LAMPS—See Lamps, Oil

OIL METERS—See Meters, Gasoline or Oil

OIL PUMPS—See Lubricators

OIL RETAINING RINGS—See Washers, Felt

OIL SEPARATORS—See Separators, Oil

OIL TEMPERING—See Treating Heat

OIL TEST COCKS FOR FORDS—See Gages, Oil

OILERS, CUP—See Cups, Oil and Grease

OILERS, ENGINE—See Lubricators

OILERS, SPRING LEAF—See Cups, Spring Leaf Lubricating; also Strips, Spring Leaf Lubricating; also Tools, Spring Leaf Separating

OILERS, SQUIRT—See Cans, Oiling

OILING BOXES—See Cups, Spring Leaf Lubricating

OILS, CUTTING—See Lubricants, Cutting

OILS, CYLINDER—See Oils, Lubricating

OILS, GEAR—See Oils, Lubricating; also Greases

OILS, Lubricating

A-B-C—See Layton Park Oil & Soap Co.

Acheson Graphite Co., Niagara Falls, N. Y. "Oildag." **(See page 327.)**

Admsco—See Millers Sons Co.

Advance Oil Works, 310-12 Flushing Ave., Brooklyn, N. Y.

Aerul—See Swan & Finch Co.

Ajax—See Puente Oil Co.

Albany Lubricating Co., 708-710 Washington St., New York, N. Y.

Alexander & Co., H. T., 17 Battery Pl., New York, N. Y. "Grand Prix."

Amalie—See Sonneborn Sons.

American Oil Co., Jackson, Mich. "Amoco."

American Solidified Oil Works, Post Office Sq., Boston, Mass.

Amoco—See American Oil Co.

Anticarbo—See Cincinnati Oil Works Co.

Arco Co., Euclid Ave. & E. 65th St., Cleveland, O.

Aristo—See Union Oil Co. of California.

Atlas—See Swan & Finch Co.

Aurora—See Pigot-Sayre Co.

Autlubo—See Moore Oil Co.

Auto-Use-It—See Sawyer Oil Co.

Autocrat—See Bayerson Oil Works.

Autoline—See Robinson & Son Co.

Balkan—See Jones & Bro., J.

Banner—See Clarkson & Ford Co.

Baum's Castorine Co., 104 N. George St., Rome, N. Y.

Bayerson Oil Works, E. 12th St. & P. R. R., Erie, Pa. "Autocrat," "Parolene."

Belden & Co., A. G., 145 Maiden Lane, New York, N. Y. "Valvone," "Pycnoleum."

Bliven & Carrington, 29 Moore St., New York, N. Y. "Champion."

Blue Ribbon—See Sawyer Oil Co.

Borne, Scrymser Co., 80 South St., New York, N. Y. "Colonial."

Buck & Co., E. A., Worcester, Mass. "Powero."

Bull Dog—See Climax Western Oil Co.

Bully—See Weinberg & Co.

Calypsol—See Cataract Refining & Mfg. Co.

Cataract Refining & Mfg. Co., Marine National Bank Bldg., Buffalo, N. Y. "Calypsol."

Cincinnati Oil Works Co., 525 Eggleston Ave., Cincinnati, O. "Anticarbo."

Clarkson & Ford Co., 55 Water St., New York, N. Y. "Banner."

Climax Lubricating Co., 218 N. 13th St., Philadelphia, Pa.

Climax Western Oil Co., 2824 Tenth Ave., S., Minneapolis, Minn. "Bull dog."

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Standard and Special Milled Screw Machine Work made from Iron, Steel and Brass Bars. Capacities up to 2¼ diameter and 10½" long. Quotations on your work from samples or blueprints.

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CARRIAGE
MACHINE
STEP
STOVE
RIBBED NECK

RIVETS

COTTERS

NUTS — SQUARE
HEXAGON
SEMI FINISHED
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FORGED STEEL WING NUTS

SPRING COTTER PINS

WOOD SCREWS

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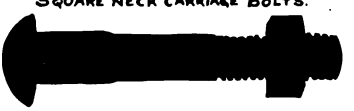
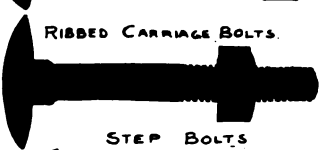

RIBBED CARRIAGE BOLTS.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ALL KINDS OF SPECIAL BOLTS NUTS OR SCREWS. SEND SAMPLE FOR PRICE

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WE SOLICIT YOUR INQUIRES.

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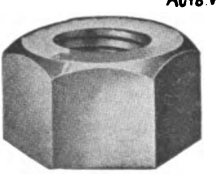
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OILS, Lubricating (Continued)

Colgan Mfg. & Supply Co., 118 Maiden Lane, New York, N. Y.

Colonial—See Borne, Scrymser Co.

Columbia Refining Co., 90 West St., New York, N. Y.

Commodore—See Miller Co.

Conn-O-Co—See Connecticut Oil Co.

Connecticut Oil Co., 549 S. Leonard St., Waterbury, Conn. "Conn-O-Co."

Continental Oil Products Co., 208 S. La Salle St., Chicago, Ill.

Cortland Specialty Co., 174-78 Railroad St., Cortland, N. Y. "Houts Warren."

Crane & Co., L. M., 91 Oliver St., Boston, Mass. "Eureka."

Crawford Co., Wm. J., 14 Wood St., Pittsburgh, Pa.

Crew-Levick Co., 111 N. Broad St., Philadelphia, Pa. "Perfection."

Crown—See Swan & Finch Co.

Crown—See Great Western Oil Co.

Crystal Oil & Paint Co., 6500 Detroit Ave., Cleveland, O.

Currola—See Curry Bros. Oil Co.

Curry Bros. Oil Co., 253-55 Franklin St., Boston, Mass. "Currola," "Superba."

Dearborn Chemical Co., McCormick Bldg., Chicago, Ill.

Defiance—See Waverly Oil Works Co.

Drake Oil Co., 99 E. Spring St., Titusville, Pa. "Speed-Oil."

Duplex—See Enterprise Oil Co.

Durkee-Atwood Co., Minneapolis, Minn. "Rie-Nie."

Eagle Oil & Supply Co., 45 India St., Boston, Mass. "Eagleine."

Eagleine—See Eagle Oil & Supply Co.

Eastern Supply Co., Hammond & Canterbury Sts., Worcester, Mass.

Emco—See Emery Mfg. Co.

Emery Mfg. Co., Bradford, Pa. "Emco."

En-Ar-Co—See National Refining Co.

Energine Refining & Mfg. Co., The Arcade, Cleveland, O.

Ensign Refining Co., 10605 Quebec Ave., Cleveland, O.

Enterprise Oil Co., 164 Chandler St., Buffalo, N. Y. "Duplex."

Eureka—See Crane & Co.

Excelsior—See Miller's Sons.

Excelsior—See Mills Oil Co.

Expert—See Warren Refining & Chemical Co.

F. V.—See Wadhams Oil Co.

Faultless—See Hawkeye Oil Co.

Fiske Bros. Refining Co., 24 State St., New York, N. Y. "Lubroleine."

Foco Oil Co., Liberty St., Franklin, Pa. "Focolene."

Frank Oil Co., 23 W. Spring St., Titusville, Pa.

Frazer Lubricator Co., 3921 Normal Ave., Chicago, Ill.

French—See Marshall Oil Co.

Fulcrum Oil Co., Franklin, Pa.

Gargoyle Mobiloils—See Vacuum Oil Co.

Gearese—See Swan & Finch Co.

General Oil Works Co., Traction Bldg., Indianapolis, Ind. "Reliable."

Gibbs-Brown Oil & Gasoline Co., 500-10 S. Theresa Ave., St. Louis, Mo. "Vortex."

Govoline—See Interocean Oil Co.

Grand Prix—See Alexander & Co.

Great Western Oil Co., 2855 E. 37th St., Cleveland, O. "Nokarbo," "Crown."

Greenslade Oil Co., 40 Jefferson Ave., Detroit, Mich.

Gulf Refining Co., Frick Annex, Pittsburgh, Pa. "Supreme."

Haggerty Refining Co., 50 South St., New York, N. Y. "Thermo."

Hall-Thompson Co., Hartford, Conn. "Wonder Worker." (See page 739.)

Harris Oil Co., A. W., 326 S. Water St., Providence, R. I.

Havoline—See Indian Refining Co.

Hawkeye Oil Co., Miles & Roosevelt Sts., Waterloo, Ia. "Faultless."

Haws, George A., 135 Front St., New York, N. Y. "Panhard."

Hinds & Coon, 124-26 Pearl St., Boston, Mass. "Peach."

Hollingshead Co., R. M., 112 N. Ninth St., Camden, N. J. "Whiszoil."

Houts Warren—See Cortland Specialty Co.

Houghton & Co., E. F., 240 Somerset St., Philadelphia, Pa.

I. X. L.—See Kramer Oil Co.

Ideal—See Sheppard, W. S.

Imperial Oil Co., 1915 Locust St., St. Louis, Mo. (See page 197.)

Indian Refining Co., 244 Madison Ave., New York, N. Y. "Havoline."

Inter-Lube Chemical Co., 1223 Superior St., Cleveland, O.

Interocean Oil Co., 90 West St., New York, N. Y. "Govoline."

Invincible—See Miller's Sons Co.

Jones & Bro., J., 429 Locust St., Philadelphia, Pa. "Balkan."

Kellogg & Co., E. H., 242-44 South St., New York, N. Y.

Kendall Refining Co., Bradford, Pa.

Keystone Oil & Mfg. Co., 111 N. Market St., Chicago, Ill.

Kramer Oil Co., W. J., 214-16 Reed St., Milwaukee, Wis. "I. X. L."

Layton Park Oil & Soap Co., M. & M. Bank Bldg., Milwaukee, Wis. "A-B-C."

Lesoyl—See Lumen Bearing Co.

Liberty—See Richardson Lubricating Co

Loos & Dilworth, 134 S. Front St., Philadelphia, Pa. "Pioneer."

Lubroleine—See Fiske Bros. Refining Co.

Lumen Bearing Co., 197 Lathrop St., Buffalo, N. Y. "Lesoyl."

McLean-Jones Oil & Supply Co., 40 India Wharf, Boston, Mass. "Swastika."

Magie Bros., 110-12 S. Clinton St., Chicago, Ill. "Rock."

Marathon—See Riverside Oil Co.

Marshall Oil Co., Marshalltown, Ia. "French."

Miller Co., Wm. P., 244-50 Green St., Brooklyn, N. Y. "Commodore."

Miller's Sons, Wm. P., Brooklyn, N. Y. "Excelsior," "Pan-O-Lite."

Miller's Sons Co., A. D., Columbus & Preble Aves., Pittsburgh, Pa. "Admsco," "Invincible," "Olympia."

Mills Oil Co., 263 Walton St., Syracuse, N. Y. "Excelsior."

Milwaukee Lubricants Co., 224 Broadway, Milwaukee, Wis.

Monamobile—See Monarch Mfg. Co.

Monarch Mfg. Co., Council Bluffs, Ia. "Monamobile."

Monogram—See New York Lubricating Oil Co.

Moon Specialty Co., 14 Dover St., New York, N. Y.

Moore Oil Co., York St. & McLean Ave., Cincinnati, O. "Autlubo."

Motorlight—See Petroleum Coke Co.

Motorlube—See Tygert Co.

Motorol—See New York & New Jersey Lubricant Co.

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MOTOR OILS AND GREASES

WOLVERINE LUBRICANTS COMPANY, 80 Broad St., New York

Stations and Distributing Agents at convenient points.

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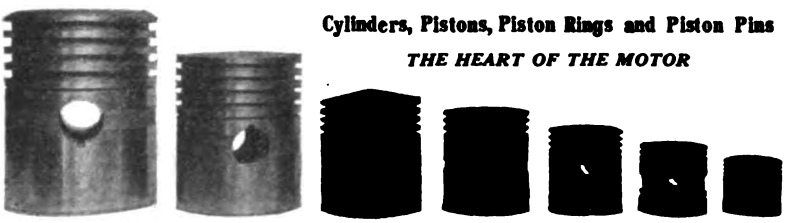

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THE HEART OF THE MOTOR

We Originate, design and manufacture

WAINWRIGHT ENGINEERING CORPORATION, Connersville, Ind.

"WAVERLY" AUTO OILS

BRANDS:

"Waverly Special" "Light" "Medium" "Heavy" "Extra Heavy"

Distilled, refined, filtered "Pennsylvania Products"—not acid treated.
Big book on oils—Free.
Establish your own Brands—*Big Profits.*

SPECIAL OFFER FOR DISTRIBUTORS

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Independent Refiners Established 1880

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Oilzum MOTOR OILS & LUBRICANTS

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Used by The Leading Race Drivers

LUBRICATES LONGER and BETTER and LEAVES LESS CARBON THAN OTHER OILS

Agents Wanted in Unoccupied Territory. *Write for Attractive Proposition.*

THE WHITE & BAGLEY CO. Worcester, Mass.

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OILS, Lubricating (Continued)

Motul—See Swan & Finch Co.
National Oil & Supply Co., 180 Frelinghuysen Ave., Newark, N. J. "Viscos."
National Refining Co., Rose Bldg., Cleveland, O. "En-Ar-Co."
New York Lubricating Oil Co., 116 Broad St., New York, N. Y. "Monogram."
New York & New Jersey Lubricant Co., 165 Broadway, New York, N. Y. "Motorol."
Noble Refining Co., 706 Canal Rd., Cleveland, O.
Nokarbo—See Great Western Oil Co.
Nye, Wm. F., New Bedford, Mass.
O'Neil Oil & Paint Co., 297-303 E. Water St., Milwaukee, Wis. "Velvet."
Oildag—See Acheson Graphite Co.
Oilzum—See White & Bagley Co.
Olympia—See Miller's Sons Co.
Opaline—See Sinclair Refining Co.
Ottomo—See Pioneer Mfg. Co.
Panhard—See Haws, Geo. A.
Pan-O-Lite—See Miller's Sons.
Paragon Refining Co., 2935 Front St., Toledo, O. "Petrolene."
Parker Refining Co., 1307 W. 11th St., Cleveland, O.
Parolene—See Bayerson Oil Works.
Pathfinder—See Sweet, Charles F.
Patterson Lubricating Co., 114 Broad St., Boston, Mass.
Penn Petroleum & Supply Co., 115-17 N. Second St., Philadelphia, Pa. "Primus."
Perfection—See Crew-Levick Co.
Perfection—See Wood Co.
Perry Oil Co., 372 Central Ave., Pawtucket, R. I.
Petrolene—See Paragon Refining Co.
Petroleum Coke Co., Edgemont & Venango Sts., Philadelphia, Pa. "Motorlight."
Petroleum Products Co., 39th St. & B. & O. R. R., Pittsburgh, Pa. "Sound-Proof."
Phinney Bros. Co., Oil City, Pa. "Quaker State."
Pigot-Sayre Co., 71-73 Front St., New York, N. Y. "Aurora."
Pioneer—See Loos & Dilworth.
Pioneer Mfg Co., Howard Ave. & E. 103d St., Cleveland, O. "Ottomo."
Polarine—See Standard Oil Co. of N. Y.
Powero—See Buck & Co.
Primus—See Penn Petroleum & Supply Co.
Puente Oil Co., Central Bldg., Los Angeles, Cal. "Ajax."
Pure Oil Co., First St. & 13th Ave., S., Minneapolis, Minn. "Puritan."
Pure Oil Co., Fifth & Chestnut Sts., Philadelphia, Pa.
Puritan—See Pure Oil Co.
Puritan Oil & Paint Co., 1218 W. 70th St., Cleveland, O
Pycnoleum—See Belden & Co.
Quaker State—See Phinney Bros. Co.
Reliable—See General Oil Works Co.
Reynoil—See Reynolds Oil & Grease Co.
Reynolds Oil & Grease Co., 123 Oliver St., Boston, Mass. "Reynoil."
Richardson Lubricating Co., Quincy, Ill. "Liberty."
Rie-Nie—See Durkee-Atwood Co.
Riverside Oil Co., Benedum Trees Bldg., Pittsburgh, Pa. "Marathon."
Robinson & Son Co., Wm. C., 32 South St., Baltimore, Md. "Autoline."
Rock—See Magie Bros.
Sawyer Oil Co., Howard B., 62 Long Wharf, Boston, Mass. "Blue Ribbon," "Auto-Use-It."
Sheppard, W. S., 21 Lawrence St., Newark, N. J. "Ideal."
Sinclair Refining Co., 111 W. Washington St., Chicago, Ill. "Opaline," "Sinco."
Sinco—See Sinclair Refining Co.
Sonneborn Sons, L., 262 Pearl St., New York, N. Y. "Amalie." (See page 277.)
Sound-Proof—See Petroleum Products Co.
Speare's Sons Co., Alden, 140 Sixth St., Boston, Mass.
Speed Oil—See Drake Oil Co.
Standard Oil Co. of N. Y., 26 Broadway, New York, N. Y. "Polarine," "Zerolene."
Sullivan Oil Co., 413 Wells St., Chicago, Ill.
Sun Co., 1428 S. Penn Sq., Philadelphia, Pa.
Superba—See Curry Bros. Oil Co.
Superior Oil Co., Century Bldg., Cleveland, O.
Supreme—See Gulf Refining Co.
Sutherland & Co., P., 232 Milk St., Boston, Mass. "Velvet."
Swan & Co., Alden S., 185 Front St., New York, N. Y. "Swanoleine."
Swan & Finch Co., 165 Broadway, New York, N. Y. "Atlas," "Crown," "Motul," "Gearese," "Aerul.."
Swanoleine—See Swan & Co.
Swastika—See Mc-Lean-Jones Oil & Supply Co.
Sweet, Charles F., 247 State St., Hartford, Conn. "Pathfinder."
Texaco—See Texas Co.
Texas Co., 17 Battery Pl., New York, N. Y. "Texaco."
Thermo—See Haggerty Refining Co.
Three-In-One Oil Co., 165 Broadway, New York, N. Y.
Tide Water Oil Co., Bowling Green Bldg., New York, N. Y. "Veedol." (See page 487.)
Tiger—See Tygert Co.
Tiona Refining Co., Madison Ave. & Belt Ry., Indianapolis, Ind.
Trojan—See Tropical Paint & Oil Co.
Tropical Paint & Oil Co., W. 70th St. & L. S. & M. S. Ry., Cleveland, O. "Trojan."
Tygert Co., E. A., 126 N. Front St., Philadelphia, Pa. "Motorlube," "Tiger."
Underhay Oil Co., 276 Franklin St., Boston, Mass.
Union Oil Co. of California, San Francisco, Cal. "Aristo."
Union Petroleum Co., Widener Bldg., Philadelphia, Pa.
Vacuum Oil Co., 61 Broadway, New York, N. Y. "Gargoyle Mobiloils."
Valvoline Oil Co., 11 Broadway, New York, N. Y.
Valvone—See Belden & Co.
Veedol—See Tide Water Oil Co.
Velvet—See O'Neil Oil & Paint Co.
Velvet—See Sutherland & Co.
Visco Motor Oil Co., 2104 Superior Viaduct, Cleveland, O.
Viscomotor—See Viscosity Oil Co.
Viscos—See National Oil & Supply Co.
Viscosity Oil Co., 1101-03 W. 37th St., Chicago, Ill. "Viscomotor."
Vortex—See Gibbs-Brown Oil & Gasoline Co.
Wadhams Oil Co., 357 Clinton St., Milwaukee, Wis. "F. V."
Warren Refining & Chemical Co., Cleveland, O. "Expert."
Waverly Oil Works Co., Pittsburgh, Pa. "Defiance." (See page 479.)
Weinberg & Co., J. H., 123 Maiden Lane, New York, N. Y. "Bully."
Whale—See Nye, Wm. F.
White Star Refining Co., 615 Avery Ave., Detroit, Mich.

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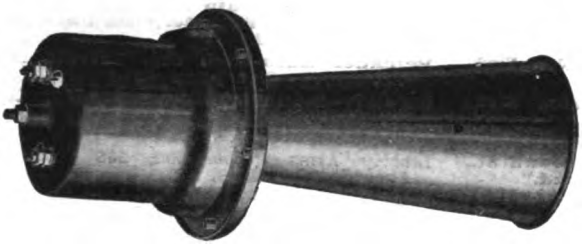

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Vibrator and Motor Driven Types. Circuit Breakers. Push Buttons. Electric Bells for the Factory, Department Store, Boats, Mines, Street Cars, Pipe Lines. Telephone Extension Bells and Buzzers.

Schwarze Electric Co.
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QUALITY McK Co INC. B&M SERVICE

ESTABLISHED 1856

Brass and Bronze Castings
Rough or Finished
Specialties to order
Plating all kinds.
Brass and Copper
Tubing, Pipe, Sheet and Rod.

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1st Ave. & Ross St., Pittsburgh, Pa.

The Most Striking Equipment of the Ford Accessory Market

The Taber Combined Cutout and Muffler

For Ford Cars

Every Ford owner wants one—
Dealers are making big money—

Can not blow out—
Will not rattle—
Reduces carbon—
Eliminates back pressure—

Keeps the motor running clean, sweet and smooth under all conditions.

Jobbers and dealers are invited to co-operate in supplying demand—National Advertising Campaign just getting under way.

Write or wire for attractive "NO-RISK" proposition.

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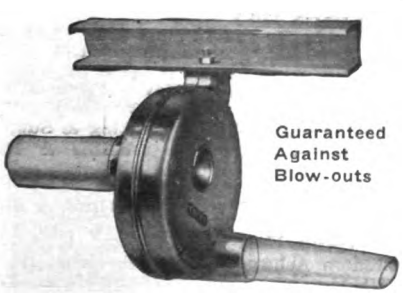

is really a direct discharge without noise. Report of test made at Joseph Tracy's official laboratory to compare The VACUUM MUFFLER with free exhaust

"At the Speed of Maximum Torque about 13% better."

It is the smallest and lightest muffler for its capacity, made only of two castings.

Give us your special requirements and blue prints. We can then furnish samples and quote best prices.

The Vacuum Muffler Corporation
154 NASSAU STREET, NEW YORK

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OILS, Lubricating (Continued)

White & Bagley Co., Worcester, Mass. "Oilzum." (See page 479.)

Whizoil—See Hollingshead Co.

Winn, Wm. R., 143 Maiden Lane, New York, N. Y.

Winne, Howard B., 714 W. Jackson Blvd., Chicago, Ill.

Wolf's Head—See Wolverine Lubricants Co.

Wolverine Lubricants Co., 80 Broad St., New York, N. Y. "Wolf's Head." (See page 479.)

Wonder Worker—See Hall-Thompson Co.

Wood Co., W. A., 373 Atlantic Ave., Boston, Mass. "Perfection."

Youkim—See Young & Kimball.

Young & Kimball, Frank L., 111 Purchase St., Boston, Mass. "Youkim."

Zerolene—See Standard Oil Co. of N. Y.

Zurn Co., O. F., 2736-38 N. Broad St., Philadelphia, Pa. "Zurnoil."

Zurnoil—See Zurn Co.

OILS, NON-FLUID—See Greases, Cup and Gear

OLDHAM COUPLINGS—See Couplings, Magneto

ONE-MAN TOPS—See Tops

OPEN END WRENCHES—See Wrenches, Nut and Bolt

OPENERS, Curtain

(A device to be attached to doors of open cars so that storm curtains may be opened with the doors)

Blackmore, Charles C., Dayton, O. (See page 483.)

Ervien, Horace, Ogontz, Pa.

Holcker-Elberg Mfg. Co., 16th & McGee Sts., Kansas City, Mo.

Jitney Curtain Co., 30 N. Ludlow St., Dayton, O.

Kelly & Towers, 1618 Walnut Ave., Cleveland, O. "Towers."

Towers—See Kelly & Towers.

OPENERS, Curtain, for Fords

(A device to be attached to doors of open cars so that storm curtains may be opened with the doors)

Blackmore, Charles C., Dayton, O. (See page 483.)

OPENERS, Electric Garage Door

(For manually operated openers—See Holders and Openers, Garage Doors.)

Allith-Prouty Co., Danville, Ill. (See page 351.)

Lovejoy Automatic Door Opener Co., Laramie, Wyo.

Mechanical Products Co., Chicago, Ill.

OPENERS, PET COCK, FOR FORDS—See Wrenches, Oil Cock

ORNAMENTS, Radiator

(For Flag Ornaments—See Flags; also Holders, Flag; for Metal Monograms—See Monograms, Ornamental)

Aetna Brass Mfg. Co., 1633 E. 55th St., Cleveland, O.

Allen Pin Co., 101 Sabin St., Providence, R. I.

Art Metal Works, 7 Mulberry St., Newark, N. J. "Moto-Fan."

Balzer Co., Gus, New York American Bldg., New York, N. Y.

Benwill Mfg. Co., 450 Vermont Pl., Columbus, O.

Cramp & Sons Ship & Engine Building Co., William, Philadelphia, Pa. (See page 453.)

Defender Auto-Lock Co., Detroit, Mich. "Liberty." (See page 421.)

Ing-Rich—See Ingram-Richardson Mfg. Co.

Ingram-Richardson Mfg. Co., Beaver Falls, Pa. "Ing-Rich."

Liberty Arms Corporation, 236 Huntington Ave., Boston, Mass.

Liberty Plane—See Defender Auto-Lock Co.

Masco—See Milwaukee Auto Specialty Co.

Metalware Corp.—See Zinke Co.

Milwaukee Auto Specialty Co., 705-15 Chestnut St., Milwaukee, Wis. "Masco."

Moto-Fan—See Art Metal Works.

National Can Co., Detroit, Mich. (See page 553.)

Oakes Co., Indianapolis, Ind. (See page 279.)

Pierrot Novelty Co., Merchants Bank Bldg., Indianapolis, Ind.

Prismolite Co., Fourth & Gay Sts., Columbus, O.

Reliberger Mfg. Co., 548 Webster Ave., Chicago, Ill.

Riley-Klotz Mfg. Co., 17 Mulberry St., Newark, N. J.

Robbins & Myers Co., Springfield, O. (See page 269.)

Stevens & Co., 375 Broadway, New York, N. Y.

Zinke Co., 1323-25 Michigan Ave., Chicago, Ill. (Sole Distributors for Metalware Corp., Chicago, Ill.) (See page 552.)

ORNAMENTS, TRANSFER—See Transfers, Decalcomania

OUTBOARD MOTORS, MOTOR BOAT—See Motors, Motor Boat Outboard

OVERALLS—See Clothing, Motorists

OXY-ACETYLENE WELDING—See Welding, Autogenous

OXY-ACETYLENE WELDING MACHINES—See Machines, Autogenous Welding

OXYGEN CYLINDER CLEANING APPARATUS—See Machines, Motor Decarbonizing

OXYGEN TANK TRUCKS — See Trucks, Oxygen Tank

OXYGEN TANKS—See Tanks, Oxygen

PACKING, Asbestos and Fibrous

A-B-C—See American Brake-Lining Co.

Advance Packing & Supply Co., 11 N. Franklin St., Chicago, Ill. "Bestalline," "Tenax."

Ambesco—See American Asbestos Co.

American Asbestos Co., 1219 Stanbridge St., Norristown, Pa. "Ambesco." (See page 415.)

American Brake-Lining Co., Lansdale, Pa. "A-B-C." (See page 415.)

Asbestos & Rubber Works of America, 1790 Broadway, New York, N. Y. "Motobestos." (See page 425.)

Bestalline—See Advance Packing & Supply Co.

Calibestos—See General Asbestos & Rubber Co.

Crandall Packing Co., Palmyra, N. Y.

Defender—See Woven Steel Hose & Rubber Co.

Demon—See Hart Packing Co.

Dominion Asbestos & Rubber Corp., 154 Nassau St., New York, N. Y.

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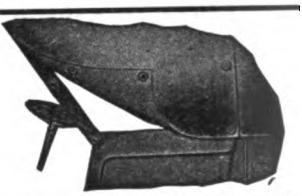
FASTENERS



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Motor Electrical Equipment Co., 1251 S. Michigan Ave., Chicago, Ill.

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PACKING, Asbestos and Fibrous (Continued)

Eagle Oil & Supply Co., 45 India St., Boston, Mass.

Empire Rubber & Tire Co., Mulberry St. & Clinton Ave., Trenton, N. J. "Motobestos."

Empire Weaving & Belting Corp. (East Rochester), Rochester, N. Y.

Endura Mfg. Co., 6317 Eastwick Ave., Philadelphia, Pa.

Essex Rubber Co., Trenton, N. J.

Federal Asbestos Co., Van Houten St., Paterson, N. J.

Fibre Finishing Co., 27 State St., Boston, Mass. "Vellumoid."

Garlock Packing Co., Palmyra, N. Y.

General Asbestos & Rubber Co., Charleston, S. C. "Calibestos." (See Back Cover.)

Goodyear Tire & Rubber Co., Akron, O. (See page 861.)

Hart Packing Co., 144 High St., Boston, Mass. "Demon."

J. M.—See Johns-Manville Co.

Johns-Manville Co., H. W., Madison Ave. & 41st St., New York, N. Y. "J. M."

Keasbey & Mattison Co., Ambler, Pa.

Knowlton Rubber Co., Geo. W., 60 Pearl St., Boston, Mass.

Luxoid—See Thermoid Rubber Co.

Motobestos—See Asbestos & Rubber Works of America.

Motobestos—See Empire Rubber & Tire Co.

Springbestos—See Springman Paper Products Co.

Springman Paper Products Co., 73-77 Larned St., W. Detroit, Mich. "Springbestos. "Springrite." (See page 355.)

Springrite—See Springman Paper Products Co.

Staybestos Mfg. Co., 5534 Lena St. (Germantown), Philadelphia, Pa.

Tenax—See Advance Packing & Supply Co.

Thermoid Rubber Co., Trenton, N. J. "Luxoid." (See pages 373 and 397.)

Vellumoid—See Fibre Finishing Co.

Wearwell Gasket & Packing Co., Camden, N. J. (See page 501.)

Woven Steel Hose & Rubber Co., Trenton, N. J. "Defender." (See page 415.)

PACKING, FIBROUS—See Packing, Asbestos

PACKING, METALLIC—See Gaskets, Metallic

PACKING, Rubber

Boston Belting Co., 34 Linden Park St., Boston, Mass.

Bowers Rubber Works, 68-70 Sacramento St., San Francisco, Cal.

Cincinnati Rubber Mfg. Co., Cincinnati, O. "Royal," "Plymouth," "Sandow," "Wampus." (See page 361.)

Crandall Packing Co., Palmyra, N. Y.

Eagle Oil & Supply Co., 45 India St., Boston, Mass.

Garlock Packing Co., Palmyra, N. Y.

Goodyear Tire & Rubber Co., Akron, O. (See page 861.)

Hamilton Rubber Mfg. Co., Mead & Prince Sts., Trenton, N. J.

Hart Packing Co., 144 High St., Boston, Mass.

Home Tire Co., Trenton, N. J.

Knowlton Rubber Co., Geo. W., 60 Pearl St., Boston, Mass.

Manhattan Rubber Mfg. Co., Willett St., Passaic, N. J.

National India Rubber Co., Bristol, R. I.

New Jersey Car Spring & Rubber Co., Wayne & Brunswick Sts., Jersey City, N. J.

New York Belting & Packing Co., 91 Chambers St., New York, N. Y.

Plymouth—See Cincinnati Rubber Mfg. Co.

Quaker City Rubber Co., 629 Market St., Philadelphia, Pa.

Republic Rubber Co., Youngstown, O.

Royal—See Cincinnati Rubber Mfg. Co.

Sandow—See Cincinnati Rubber Mfg. Co.

Voorhees Rubber Mfg. Co., 18-46 Bostwick Ave., Jersey City, N. J.

Wampus—See Cincinnati Rubber Mfg. Co.

PADDING, FRAME—See Lining, Body or Frame

PADLOCKS—See Locks, Cabinet and Pad

PADS, LICENSE—See Numbers, License

PADS, PEDAL—See Grips, Pedal

PAILS, FOLDING—See Buckets, Collapsible

PAINT BRUSHES—See Brushes, Paint

PAINT DRYING ROOMS—See Rooms, Paint and Varnish Drying

PAINT FILLERS—See Fillers, Paint

PAINT REMOVERS—See Removers, Paint, Enamel and Varnish

PAINTS, Aluminum and Bronze

Alustrium—See Devoe & C. T. Raynolds Co.

Arnold, N. B., 1 Sigourney St., Brooklyn, N. Y. "Slikup."

Baer Bros., 438-48 W. 37th St., New York, N. Y.

Benoit, Constant A., Brooklyn, N. Y. "Permatex." (See page 169.)

Bilchaco—See Billings-Chapin Co.

Billings-Chapin Co., Cleveland, O. "Bilchaco."

Binswanger & Co., B., 829-35 N. Third St., Philadelphia, Pa.

Bronze Powder Works Co., Elizabeth, N. J. "Ideal," "Vulcan."

Cullen & Co., F. C., First National Bank Bldg., Chicago, Ill.

Devoe & C. T. Raynolds Co., F. W., 101 Fulton St., New York, N. Y. "Alustrium."

Gerstendorfer Bros., 231 E. 42d St., New York, N. Y. "Sapolin."

Ideal—See Bronze Powder Works Co.

Jewel—See Wadsworth-Howell & Co.

Kemp Co., W. H., 165 Spring St., New York, N. Y.

Northwestern Chemical Co., 610 State St., Marietta, O. "Norwesco." (See page 205.)

Norwesco—See Northwestern Chemical Co.

Nubian Paint & Varnish Co., 1856 Le Claire Ave., Chicago, Ill. "Victory."

Permatex—See Benoit, Constant A.

Sapolin—See Gerstendorfer Bros.

Schlegel Mfg. Co., Oscar, 111 E. 12th St., New York, N. Y.

Slikup—See Arnold, N. B.

Uhlfelder Co., Leo, 130-32 W. 29th St., New York, N. Y.

Victory—See Nubian Paint & Varnish Co.

Vulcan—See Bronze Powder Works Co.

Wadsworth-Howland Co., 225 N. Carpenter St., Chicago, Ill. "Jewel."

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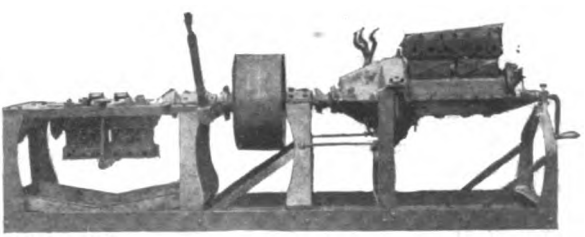

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PAINTS, BRONZE—See Paints, Aluminum

PAINTS, CYLINDER—See Paints, Exhaust Pipe

PAINTS, Enamel

Acme White Lead & Color Works, 1740-1800 St. Aubin Ave., Detroit, Mich.

Ad-El-Ite—See Adams & Elting Co.

Adams & Elting Co., 716-26 Washington Blvd., Chicago, Ill. "Ad-el-ite." (See page 199.)

Akron Varnish Co., Akron, O. "Imperial."

Armitage & Co., John L., Newark, N. J. "Armorcote."

Armorcote—See Armitage & Co.

Ault & Wiborg Co., New, Seventh & Culvert Sts., Cincinnati, O.

Autonamel Co., 94-97 St. Paul St., Rochester, N. Y.

Bay State—See Wadsworth, Howland & Co.

Berry Bros., 71 Lieb St., Detroit, Mich.

Bilchaco—See Billings-Chapin Co.

Billings-Chapin Co., Cleveland, O. "Bilchaco."

Bird & Co., J. A. & W., 88 Pearl St., Boston, Mass. (Importers.) "Ripolin."

Blaxshine—See Twin City Varnish Co.

Boyer Chemical Co., 18 E. Kinzie St., Chicago, Ill.

Chase, Roberts & Co., Fifth St. & West Ave., Long Island City, N. Y.

Cleveland Varnish Co., 3111 E. 87th St., Cleveland, O.

Columbus Varnish Co., Columbus, O. "Peerless." (See page 253.)

Detroit White Lead Works, 530-60 Milwaukee Ave., E., Detroit, Mich.

Devoe & C. T. Raynolds Co., F. W., 101 Fulton St., New York, N. Y.

Effecto—See Pratt & Lambert.

Essex Varnish Co., 92 Vesey St., Newark, N. J.

Felton, Sibley & Co., 136-40 N. Fourth St., Philadelphia, Pa.

Flint Varnish & Color Works, Flint, Mich.

Forest City Paint & Varnish Co., 3334 Lakeside Ave., Cleveland, O.

Glidden Co., Cleveland, O. (See page 741.)

Hanline Bros., 23-25 Howard St., Baltimore, Md.

Imperial—See Akron Varnish Co.

McDougall Varnish Co., 24 Evans St., Buffalo, N. Y.

Martin-Senour Co., 2510 Quarry St., Chicago, Ill.

Masury & Son, John W., 44-50 Jay St., Brooklyn, N. Y.

Moller & Schumann Co., 3 Gerry St., Brooklyn, N. Y.

Mound City Paint & Color Co., 11th & Mullanphy Sts., St. Louis, Mo.

Peerless—See Columbus Varnish Co.

Pratt & Lambert, 79 Tonawanda St., Buffalo, N. Y. "Effecto."

Ripolin—See Bird & Co.

Royal—See Wilhelm Co.

Sherwin-Williams Co., 100 Canal St., Cleveland, O.

Standard Varnish Works, 90 West St., New York, N. Y.

Twin City Varnish Co., 208 N. Wabash Ave., Chicago, Ill. "Blaxshine."

Valentine & Co., 456 Fourth Ave., New York, N. Y.

Wadsworth, Howland & Co., 141 Federal St., Boston, Mass. "Bay State."

Wilhelm Co., Third & Bern Sts., Reading, Pa. "Royal."

Won Kote Enamel Co., 16 N. Brook St., Geneva, N. Y.

PAINTS, Exhaust Pipe, Muffler and Cylinder

Arnold, N. B., 1 Sigourney St., Brooklyn, N. Y. "Slikup."

Arnstein, Eugene, 45 W. 26th St., Chicago, Ill. "Century."

Benoit, Constant A., Brooklyn, N. Y. "Permatex." (See page 169.)

Bulger Varnish Co., William, 3058 E. 87th St., Cleveland, O.

C. O. T.—See Tingley & Co.

Century—See Arnstein, Eugene.

Columbus Varnish Co., Columbus, O. "Peerless." (See page 253.)

Durkee-Atwood Co., Minneapolis, Minn. "Rie-Nie."

E-Fec-Tiv—See Permatite Mfg. Co.

Hall-Thompson Co., Hartford, Conn. "Wonder Worker." (See page 739.)

Never-Burn—See Northwestern Chemical Co.

Northwestern Chemical Co., 610 State St., Marietta, O. "Never-Burn." (See page 205.)

Nu-Back Mfg. Co., 114 N. Commercial St., St. Louis, Mo.

Peerless—See Columbus Varnish Co.

Permatex—See Benoit, Constant A.

Permatite Mfg. Co., 67 Fifth Ave., N. E., Minneapolis, Minn. "E-Fec-Tiv."

Porcelain Products Co., Fulton Bldg., Pittsburgh, Pa. "Ulticoat."

Rie-Nie—See Durkee-Atwood Co.

Slikup—See Arnold, N. B.

Stowell, E. R., Oden, Mich.

Tingley & Co., Chas. O., 21 St. Georges Ave., Rahway, N. J. "C. O. T."

Ulticoat—See Porcelain Products Co.

Van Cleef Bros., 7709-11 Woodlawn Ave., Chicago, Ill.

Van Tilburg Oil Co., 2424-28 University Ave., S. E., Minneapolis, Minn. "Wang."

Wang—See Van Tilburg Oil Co.

Wonder Worker—See Hall-Thompson Co.

Wilhelm Co., A., Third & Bern Sts., Reading, Pa. "Royal."

Won Kote Enamel Co., 16 N. Brook St., Geneva, N. Y.

PAINTS, Luminous

(For clock, meter or gage dials)

Cold Light Mfg. Co., 558 W. 158th St., New York, N. Y. "Marvelite."

Cummings Chemical Co., W.L. (Lansdowne), Philadelphia, Pa.

Luma—See Radium Chemical Co.

Marvelite—See Cold Light Mfg. Co.

Radium Chemical Co., Forbes & Meyran Aves., Pittsburgh, Pa. "Luma."

PAINTS, MUFFLER—See Paints, Exhaust Pipe

PAINTS, PHOSPHORESCENT—See Paints, Luminous

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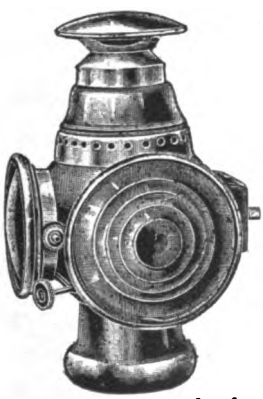

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Perfect lubrication is provided by the design of the Rotator, which permits of the constant introduction of the oil vapor to all parts. The operation of the Ceco Rotator is noiseless.

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PAINTS, Rim

(See also Paints, Aluminum and Bronze; also Paints, Enamel)

Arnold, N. B., 1 Sigourney St., Brooklyn, N. Y. "Slikup."

Be-Be-Co—See Boston Blacking Co.

Beardslee, J. W., Elmira, N. Y.

Boston Blacking Co. (E. Cambridge), Cambridge, Mass. "Be-Be-Co."

C. O. T.—See Tingley & Co.

Columbus Varnish Co., Columbus, O. "Peerless," (See page 253.)

Crum Mfg. Co., 120 N. Main St., Ottawa, Kans. "Rim-No-Stick."

Durkee-Atwood Co., Minneapolis, Minn. "Rie-Nie."

E-Fec-Tiv—See Permatite Mfg. Co.

Hall-Thompson Co., Hartford, Conn. "Wonder Worker." "Rim Kote." (See page 739.)

Hollingshead Co., R. M., 112 N. Ninth St., Camden, N. J. "Whiz."

Jewel—See Wadsworth-Howland Co.

Martin-Senour Co., 2510 Quarry St., Chicago, Ill.

Northwestern Chemical Co., 610 State St., Marietta, O. "Norwesco." (See page 205.)

Norwesco—See Northwestern Chemical Co.

Peerless—See Columbus Varnish Co.

Permatite Mfg. Co., 67 Fifth Ave., N. E., Minneapolis, Minn. "E-Fec-Tiv."

Puritan Soap Co., 500 Exchange St., Rochester, N. Y..

Rie-Nie—See Durkee-Atwood Co.

Rim Kote—See Hall-Thompson Co.

Rim-No-Stick—See Crum Mfg. Co.

Rim-Shim—See Spring Leaf Lubricator Co.

Slikup—See Arnold, N. B.

Spring Leaf Lubricator Co., Ann Arbor, Mich. "Rim-Shim."

Tingley & Co., Chas. O., 21 St. Georges Ave., Rahway, N. J. "C. O. T."

Wadsworth-Howland Co., 225 N. Carpenter St., Chicago, Ill. "Jewel."

Whiz—See Hollingshead Co.

Wonder Worker—See Hall-Thompson Co.

PAINTS, Rubber

(For refinishing rubber mats and matting and painting tires)

Arnold, N. B., 1 Sigourney St., Brooklyn, N. Y. "Slikup."

Arnstein, Eugene, 45 W. 26th St., Chicago, Ill. "Century."

Atlas Auto Supply Co., 697 W. Austin Ave., Chicago, Ill. "Preservo." (See page 207.)

Be-Be-Co.—See Boston Blacking Co.

Boston Blacking Co. (E. Cambridge), Cambridge, Mass. "Be-Be-Co."

Boyer Chemical Co., 18 E. Kinzie St., Chicago, Ill.

Bradley & Vrooman Co., 2629 Dearborn St., Chicago, Ill. "Velvet."

Century—See Arnstein, Eugene.

Columbus Varnish Co., Columbus, O. "Peerless." (See page 253.)

Cook, Geo. E., 2322 Broadway, New York, N. Y.

Detroit White Lead Works, 530-60 Milwaukee Ave., E., Detroit, Mich. "Rogers."

Durkee-Atwood Co., Minneapolis, Minn. "Rie-Nie Tyre Re-Nu."

E-Fec-Tiv—See Permatite Mfg. Co.

Faultless—See Hawkeye Oil Co.

French & Co., Samuel H., York Ave., Fourth & Callowhill Sts., Philadelphia, Pa.

Hall-Thompson Co., Hartford, Conn. "Wonder Worker." (See page 739.)

Hawkeye Oil Co., Miles & Roosevelt Sts., Waterloo, Ia. "Faultless."

Hollingshead Co., R. M., 112 N. Ninth St., Camden, N. J. "Whiz."

Jewel—See Wadsworth-Howland Co.

Narco Tirenew—See National Rubber Co.

National Cement & Rubber Co., 300-16 S. St. Clair St., Toledo, O.

National Rubber Co., 4409 Paulin St., St. Louis, Mo. "Narco Tirenew."

Northwestern Chemical Co., 610 State St., Marietta, O. "Tire-Lac." (See page 205.)

Nu-Back Mfg. Co., 114 N. Commercial St., St. Louis, Mo. "Rub-ber-Nu."

Peerless—See Columbus Varnish Co.

Permatite Mfg. Co., 67 Fifth Ave., N. E., Minneapolis, Minn. "E-Fec-Tiv."

Preservo—See Atlas Auto Supply Co.

Puritan Soap Co., 500 Exchange St., Rochester, N. Y. "Tyrkote."

Rie-Nie Tyre-Re-Nu—See Durkee-Atwood Co.

Rogers—See Detroit White Lead Works.

Rub-Ber-Nu—See Nu-Back Mfg. Co.

Slikup—See Arnold, N. B.

Sterling Tire Corp., Rutherford, N. J.

Tingley & Co., Chas. O., 21 St. Georges Ave., Rahway, N. J.

Tire-Lac—See Northwestern Chemical Co.

Tyrkote—See Puritan Soap Co.

Van Tilburg Oil Co., 2424-28 University Ave., S. E., Minneapolis, Minn. "Wang."

Velvet—See Bradley & Vrooman Co.

Wadsworth-Howland Co., 225 N. Carpenter St., Chicago, Ill. "Jewel."

Wang—See Van Tilburg Oil Co.

Whiz—See Hollingshead Co.

Wonder Worker—See Hall-Thompson Co.

PAINTS, TIRE—See Paints, Rubber

PAINTS and COLORS

Acme White Lead & Color Works, 1740-1800 St. Aubin Ave., Detroit, Mich.

Ault & Wiborg Co., New, Seventh & Culvert Sts., Cincinnati, O.

Bay State—See Wadsworth, Howland & Co.

Billings-Chapin Co., Cleveland, O. "Oughto."

Buckeye Paint & Varnish Co., 15th & Lucas Sts., Toledo, O.

Bulls-Eye—See Zinsser & Co.

Capitol City—See Indianapolis Paint & Color Co.

Chicago White Lead & Oil Co., 1454 S. Western Ave., Chicago, Ill. "King."

Cincinnati Varnish Co., 211 South St., Cincinnati, O.

Detroit White Lead Works, 530-60 Milwaukee Ave., E., Detroit, Mich.

Devoe & C. T. Raynolds Co., F. W., 101 Fulton St., New York, N. Y.

Ditzler Color Co., 18 W. Baltimore Ave., Detroit, Mich.

Felton, Sibley & Co., 136-40 N. Fourth St., Philadelphia, Pa.

Flint Varnish & Color Works, Flint, Mich.

Forest City Paint & Varnish Co., 3334 Lakeside Ave., Cleveland, O.

French & Co., Samuel H., York Ave., Fourth & Callowhill Sts., Philadelphia, Pa.

Graves Co., N. Z., 22-26 S. Third St., Philadelphia, Pa.

Hanline Bros., 23-25 Howard St., Baltimore, Md.

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WHAT IT IS AND WHAT IT DOES

Miracle Oil is a high grade lubricant that lives through the heat generated in a gasoline engine.

Miracle Oil saves gasoline. A saving of from 22 to 28 per cent is guaranteed. This is due to increased efficiency made possible by a proper interior lubrication, and by breaking up the molecules of gasoline.

Dealers: There is over 125% profit in selling Miracle Oil—thousands of gallons have been sold, of which 90% were repeat orders from car owners. Write us today for our terms to the trade.

DESMOND MANUFACTURING COMPANY 346 Atlantic Ave., Brooklyn, N. Y.

TWO ESSENTIAL FORD ACCESSORIES

C. & B. Timer

A rigid, durable and accurate Timer, designed to fit all models of Ford Cars without any changes.

The case is made of enameled steel, which makes it indestructible and rust-proof.

The Roller Arm is made of high grade material with hardened steel roller.

The Rims holding the Roller and Lever in place are made of hardened steel.

Ford Ignition Outfits

Complete primary and secondary wiring set of the highest grade wire. Cables cut to correct lengths and finished with copper terminals.

Primary wires furnished in contrasting colors for easily replacing in proper position.

Made up in Loom, Steel, Tubing and Braided.

Prompt Shipment. Best Quality at Lowest Prices. Jobbers write for Price List.

M. C. FERRO, 2011 Michigan Ave., CHICAGO, ILL.

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PAINTS and COLORS (Continued)

Harrison Works, 3523 Grays Ferry Rd., Philadelphia, Pa.
Heath & Milligan Mfg. Co., 1825-71 Seward St., Chicago, Ill.
High Standard—See Lowe Bros. Co.
Hildreth Varnish Co., 90 West St., New York, N. Y.
Hoffman Paint & Varnish Co., 3 Medford St., Boston, Mass.
Indianapolis Paint & Color Co., 118 W. Chesapeake St., Indianapolis, Ind. "Capitol City."
Johnston Paint Co., R. F., Pearl & Main Sts., Cincinnati, O.
Keystone Paint & Filler Co., Munsey, Pa.
King—See Chicago White Lead & Oil Co.
Lowe Bros. Co., 450 E. Third St., Dayton, O. "High Standard."
Lucas & Co., John, 322-30 Race St., Philadelphia, Pa.
Masury & Son, John W., 44-50 Jay St., Brooklyn, N. Y.
Mooramel—See Moore & Co.
Moore & Co., Benjamin, 231-33 Front St., Brooklyn, N. Y. "Mooramel."
Moser Co., Chas., 215-27 E. Ninth St., Cincinnati, O.
Mound City Paint & Color Co., 11th & Mullanphy Sts., St. Louis, Mo.
Murphy Varnish Co., Chestnut & McWhorter Sts., Newark, N. J.
Nice, Eugene E., 272-74 S. Second St., Philadelphia, Pa.
Oughto—See Billings-Chapin Co.
Patterson-Sargent Co., E. 38th & St. Clair Sts., Cleveland, O.
Pierce Co., F. O., 12 W. Broadway, New York, N. Y.
St. Louis Surfacer & Paint Co., Arlington Ave. & Terminal Belt Line, St. Louis, Mo.
Sherwin-Williams Co., 100 Canal St., Cleveland, O.
Shrack & Co., C., 152 N. Fourth St., Philadelphia, Pa.
Smith & Co., Edward, Sixth St. & West Ave., Long Island City, N. Y.
Valentine & Co., 456 Fourth Ave., New York, N. Y.
Wadsworth, Howland & Co., 141 Federal St., Boston, Mass. "Bay State."
Wilhelm Co., A., Third & Bern Sts., Reading, Pa.
Willey Co., C. A., 14th & Hancock Sts., Long Island City, N. Y.
Zinsser & Co., W., 195 William St., New York, N. Y. "Bull's-Eye."

PAINTS and VARNISHES for Fords

American Automobile Accessories Co., B. & O. R. R. & Blue Rock St., Cincinnati, O.
Durkee-Atwood Co., Minneapolis, Minn. "Rie-Nie."
Forest City Paint & Varnish Co., 3334 Lakeside Ave., Cleveland, O.
Glidden Co., Cleveland, O. (See page 741.)
Hall-Thompson Co., Hartford, Conn. "Wonder Worker." (See page 739.)
Hanline Bros., 23-25 Howard St., Baltimore, Md.
Northwestern Chemical Co., 610 State St., Marietta, O. "Norwesco." (See page 205.)
Norwesco—See Northwestern Chemical Co.
Rie-Nie—See Durkee-Atwood Co.
Tropical Paint & Oil Co., W. 70th St. & L. S. & M. S. Ry., Cleveland, O.
Van Tilburg Oil Co., 2424-28 University Ave., S. E., Minneapolis, Minn. "Wang."
Wadsworth-Howland Co., 225 N. Carpenter St., Chicago, Ill.
Wang—See Van Tilburg Oil Co.
Wonder Worker—See Hall-Thompson Co.

PANELS, Wood

Almapee Veneer & Seating Co., Algoma, Wis.
American Veneer Co., 1501 Clinton St., Hoboken, N. J.
Buffalo Hardwood Lumber Co., 940 Seneca St., Buffalo, N. Y.
Dann Bros. & Co., 80-88 Franklin St., New Haven, Conn.
Eggers Veneer Seating Co., F., 19th St. & Jefferson Ave., Two Rivers, Wis.
Grand Rapids Veneer Works, 800-900 Front St., Grand Rapids, Mich.
Haskelite Mfg. Corp., Fuller Station, Grand Rapids, Mich.
Michigan Veneer Co., Alpena, Mich.
New Jersey Veneer Co., 258 W. Railway Ave., Paterson, N. J.
Roddis Lumber & Veneer Co., Marshfield, Wis.
Wisconsin Seating Co., New London, Wis.

PANELS and SWITCHBOARDS, Charging

Andrae & Sons Co., Julius, Broadway & Michigan Sts., Milwaukee, Wis.
Cutler Hammer Mfg. Co., 890 St. Paul Ave., Milwaukee, Wis.
Cutter Co., Geo., Notre Dame & Division Sts., South Bend, Ind.
Electric Products Co., Cleveland, O.
Electric Storage Battery & Mfg. Co., 602 Plum St., Cincinnati, O.
Friday Machinery & Supply Co., S. Main St., Sigourney, Ia.
General Electric Co., Schenectady, N. Y. (See pages 564 and 565.)
Hertner Electric & Mfg. Co., 1905 W. 112th St., Cleveland, O.
Leonard Electric Co., Ward, Mt. Vernon, N. Y
St. Louis Electrical Works, 4057 Forest Park Blvd., St. Louis, Mo. (See page 269.)

PANS, Drip

(For placing under cars in garages or sales rooms to catch any oil or grease that may drip)

A. Z. Co., 530 W. 56th St., New York, N. Y. (See page 563.)
Auto Metal Co., 531 Worthington St., Springfield, Mass.
Badger & Sons Co., E. B., 63-69 Pitts St., Boston, Mass.
Cornwall Mfg. Co., E. 128th St., & Penobscot Ave., Cleveland, O.
Cullen-Atkinson Co., 120 Allyn St., Hartford, Conn. "Hartford."
Dover Stamping & Mfg. Co., 385 Putnam Ave., Cambridge, Mass.
Durlach, L., 199-201 Wooster St., New York, N. Y.
Evans Mfg. Co., First Ave. & 21st St., Moline, Ill.
Hartford—See Cullen-Atkinson Co.
Koven & Bro., L. O., 154 Ogden St., Jersey City, N. J.
Lawco—See Lawson Co.
Lawson Co., F. H., Dept. D., Cincinnati, O. "Lawco." (See page 663.)
Rochester Can Co., 103-09 Hague St., Rochester, N. Y.
Sexton Can Co., 223 Franklin St., Boston Mass.
Smyth Garage Pan Mfg. Co., Patchogue, N. Y.
Todd Mfg. Co., Minneapolis, Minn. (See page 571.)

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King Safety Tail Light takes the fear out of night driving—

Makes it safe to back your car in the dark.

Equip your car with one NOW

Exceptional proposition for dealers

For particulars write

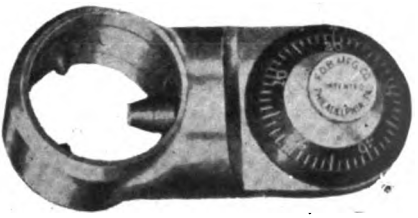
KING-BULL MFG. CO.

123 E. Ontario St., Chicago

Price $6.00 East of Denver
$6.50 West of Denver

F. O. B.

Combination Auto Lock



No Electrical contrivances to get out of order. No key locks for thieves to pick, or keys to lose. Can be attached permanently, in a few minutes, to casing or post beneath steering wheel, it then holds the wheels in rigid position, every car owner can have his individual combination. When changing chauffeurs, change combination.

Representative wanted for exclusive territory

F. O. B. Manufacturing Company, Inc.

Main Office of the Company
Real Estate Trust Building

Philadelphia Pa.

CYLINDER GRINDING

Pistons and Piston Rings

Economy of gasoline and oil requires that the cylinders, pistons and rings must be in good working order. To neglect this matter is to waste a commodity vital to the winning of the war. We can handle this line of work promptly and at prices that are right. We have always been

The LARGEST because BEST

and in our new plant at

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our facilities for rapid production will be unsurpassed. For the convenience of local trade, we are maintaining a New York Store at

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Just next to our old factory.

HOUPERT MACHINE CO.

Harris Av. & Marion St. Long Island City

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PANS or UNDER BONNETS, Dust

A. Z. Co., 530 W. 56th St., New York, N. Y. (See page 563.)

Badger & Sons Co., E. B., 62-69 Pitts St., Boston, Mass.

Brummeler's Sons Co., Wm., 413 Ionia Ave., S. W., Grand Rapids, Mich. "Brusco."

Brusco—See Brummeler's Sons Co.

Columbus Auto Brass Co., Columbus, O. (See page 395.)

Detroit Auto Specialty Co., 209-11 Greenwood Ave., Detroit, Mich.

Geuder, Paeschke & Frey Co., 1422-1700 St. Paul Ave., Milwaukee, Wis. (See page 679.)

Gier Pressed Steel Co., Lansing, Mich. (See page 505.)

McDole Automobile Sheet Metal Works, C. B., 218-20 E. Water St., Kalamazoo, Mich. "Maco." (See page 285.)

Maco—See McDole Automobile Sheet Metal Works.

Metal Auto Parts Co., Industrial Bldg., Indianapolis, Ind.

Michigan Crown Fender Co., Ypsilanti, Mich.

Michigan Stamping Co., Mack Ave. & Detroit Terminal, Detroit, Mich.

Mitchell & Son., G. F., 6501 Cedar Ave., Cleveland, O.

Moline Pressed Steel Co., East Moline, Ill.

Motors Metal Mfg. Co., Milford Ave. & P. M. R. R., Detroit, Mich.

Mullins Co., W. H., 182 Franklin St., Salem, O.

Murray Mfg. Co., J. W., Clay & St. Aubin Aves., Detroit, Mich.

Progressive Sheet Metal Co., 1976-84 Central Ave., Cincinnati, O.

Welded Steel Barrel Corp., Hart & Charlevoix Sts., Detroit, Mich.

Xardell Bros. Co., 23 Broadway, Utica, N. Y.

York Corrugating Co., York, Pa.

PANS, FLOOR—See Pans, Drip

PANS, Radiator Splash, for Fords

(Sheet metal guard or pan for front of car to prevent splashing of mud on radiator or lamps)

Steel Products Co., Rice Lake, Wis.

PANS, SOD—See Pans, Dust

PAPER, FRICTION—See Frictions, Fibre

PAPER, SAND—See Paper, Emery and Sand

PAPER SHIPPING COVERS—See Covers, Paper and Canvas Shipping

PAPER TAPES, AEROPLANE—See Tapes, Aeroplane Paper

PAPER, Emery and Sand

American Glue Co., 121 Beverly St., Boston, Mass. "Union," "New England," "Boston."

Baeder, Adamson & Co., Richmond St. & Allegheny Ave., Philadelphia, Pa.

Barton & Son Co., H. H., 109 S. Third St., Philadelphia, Pa.

Behr & Co., Herman, 61 Broadway, New York, N. Y. "Brooklyn."

Boston—See American Glue Co.

Brooklyn—See Behr & Co.

Carborundum Co., Niagara Falls, N. Y. (See page 209.)

Carbalox—See United States Sand Paper Co.

Hurculundum—See United States Sand Paper Co.

Manning Sand Paper Co., Troy, N. Y.

Minnesota Mining & Mfg. Co., 564-72 W. Randolph St., Chicago, Ill.

New England—See American Glue Co.

Union—See American Glue Co.

United States Sand Paper Co., Williamsport, Pa. "Carbalox," "Herculundum." (See page 713.)

Wausau Abrasives Co., Wausau, Wis. "Wausite."

Wausite—See Wausau Abrasives Co.

PARABOLIC REFLECTORS FOR FORDS —See Reflectors, Headlight

PARACHUTES

Knabenshue Aircraft Corp., 140 W. 42d St., New York, N. Y.

PARTS, Aircraft Wood

(Ribs, Struts, Landing Gears, etc.)

Grand Rapids Chair Co., 1661 Monroe Ave., Grand Rapids, Mich.

Holbrook Co., 166 West End Ave., New York, N. Y.

Hudson Auto-Body Corp., 507-09 W. 35th St., New York, N. Y.

Lester Piano Co., 1306 Chestnut St., Philadelphia, Pa.

Mid-West Mfg. Corp., 1547 University Ave., St. Paul, Minn.

Peck & Co., Hardman, New York, N. Y.

Pigeon Hollow Spar Co., 131 Coleridge St., East Boston, Mass.

Rogers Construction Co., Gloucester City, N. J.

West Woodworking Co., 308-24 N. Ada St., Chicago, Ill.

PARTS, COIL—See Parts, Magneto, Coil and Distributor

PARTS, Magneto, Coil and Distributor

Automotive Specialty Co., 2 Columbus Circle, New York, N. Y.

Brown & Caine, 2112 Michigan Ave., Chicago, Ill. (See page 493.)

Eastern Parts Mfg. Co., 135 Spring St., New York, N. Y. "Pemko." (See page 671.)

Gilfillian Bros., Smelting & Refining Co., 217 W. Sixth St., Los Angeles, Cal.

Guaranteed Magneto Parts Co., 1765 Broadway, New York, N. Y.

H. & L. Mfg. Co., 300 W. Broadway, New York, N. Y.

Hygrade Parts Co., 16 W. 61st St., New York, N. Y.

Magneto Parts Co., 1790 Broadway, New York, N. Y. (See page 493.)

Magneto Winding Co., 1723-25 Eighth Ave., Brooklyn, N. Y. (See page 493.)

Nelson Mfg. Co., A., 2700 Southport Ave., Chicago, Ill.

Niehoff & Co., Paul G., 232-42 E. Ohio St., Chicago, Ill. (See page 541.)

Pemko—See Eastern Parts Mfg. Co.

Rovtar Bros., 2250 S. Wood St., Chicago, Ill.

Service Auto Parts Co., 2774 Woodward Ave., Detroit, Mich.

Weidenhoff, Joseph, 1215-19 S. Ashland Ave., Chicago, Ill. (See page 519.)

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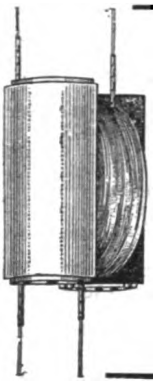


OUR HIGH TENSION

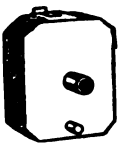
Windings and Condensers

are fully guaranteed and equal if not superior in every detail to those of the original manufacture, as we make a specialty of rewinding Armatures and Coils for all makes of Magnetos.

These departments we have greatly enlarged—which is the best proof that we satisfy our customers.

Special Attention to Dealers and Magneto Repairmen

Write to us for Details



MAGNETO WINDING COMPANY

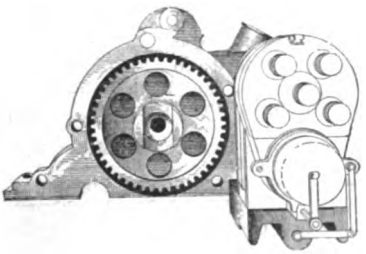
Manufacturers and Repairers

1723-25 Eighth Avenue Brooklyn, New York

Magneto Attachment for Ford Cars

With this attachment you can install on a Ford any standard make of high tension magneto, such as Bosch, Splitdorf, Eisemann or Simms.

The construction of the attachment is simple: can be installed in one hour by following our instruction. No machine work or skill needed.



We also supply guaranteed high tension magnetos and spare parts for the above makes, including switch and cable at rock bottom prices, attachment complete (magneto-base, gear housing, gears, spark advance-rod with all bolts and screws ready for installing), list $25.

Liberal discount to the trade.

Write us for full details today

MAGNETO PARTS CO.

1790 Broadway New York

WRITE!

For Catalogue No. 12

Showing repair parts to fit all makes of Ignition Systems

Magneto, Battery Distributor and Coil Parts, Iridium-Platinum Points, Tungsten and Fine Silver Contacts, Carbon, Gauze and Metal Brushes.

Manufactured by

BROWN & CAINE INC.

CHICAGO

2112 Michigan Ave. Ill.

AUTOMOBILE PARTS

MACHINE WORK ON SMALL FORGINGS AND CASTINGS IN QUANTITY TO ORDER

FINISHED CONNECTING RODS A SPECIALTY

QUOTATIONS UPON YOUR REQUIREMENTS

THE PERFECTION AUTO PARTS CO.

404 Lakeside, N. W. Cleveland, Ohio

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PARTS, Repair

(Covering Dealers in Repair Parts for Cars no longer made, who advertise in this Publication)

Allen Kingston
New Departure Mfg. Co., Bristol, Conn. (See page 95.)

Henderson
Buda Co., Harvey, Ill. (See page 467.)

Houpt Rockwell
New Departure Mfg. Co., Bristol, Conn. (See page 95.)

Michigan
Buda Co., Harvey, Ill. (See page 467.)

Penn
Buda Co., Harvey, Ill. (See page 467.)

Vulcan
Savage Arms Corp., Sharon, Pa. (See page 213.)

PARTS, Repair, for Fords

(Covering Dealers in Repair Parts for Ford Cars who advertise in this Publication)

Dunham Co., Thos., Aurora, Ill. (See page 75.)

Hill-Smith Metal Goods Co., Dept. H, Boston, Mass. (See page 221.)

Perfection Auto Parts Co., 404 Lakeside Ave., N. W., Cleveland, O. (See page 493.)

PARTS, Speedometer Repair

Motors Appliance Co., East Moline, Ill. (See page 781.)

PARTS, Wood Automobile Body

Michigan Truck & Lumber Co., Holly, Mich.
Pfau Mfg. Co., Cincinnati, O.

PASSENGER BODIES FOR FORDS—See Bodies, Special Passenger

PASTE, HAND—See Soaps, Hand

PASTE, POLISHING—See Polishes, Metal

PASTE, SOLDERING—See Flux, Soldering

PASTE, Trimmers

Buckeye Paste Co., 270 S. Wall St., Columbus, O.

PATCHES, Tire Repair

(See also Shoes, Inner Tire; also Sleeves, Tire Repair)

Acme—See Chicago Tire Goods Co.

Advance Automobile Accessories Corp., Dept. K10-1, 56 E. Randolph St., Chicago, Ill. "Taxin." (See page 423.)

Alwas-Hold Auto Patch Co., 6929 Stony Island Ave., Chicago, Ill.

Amazon Rubber Co., E. Market St., Akron, O. "O'Neil."

American Automobile Accessories Co., B. & O. R. R. & Blue Rock St., Cincinnati, O. "Vulkless."

American Rubber & Tire Co., 100 Beech St., Akron, O. "Cling-Tite."

Apache—See Phoenix Laboratories.

Arlington—See Voorhees Rubber Mfg. Co.

Auto Supply Mfg. Co., 418 S. Barstow St., Eau Claire, Wis. "Stuck-Tight.'

Born Vulcanizing & Tire Agency, Main & Church Sts., Belleville, Ill.

Braender Rubber & Tire Co., Rutherford, N. J. "Jiffy." (See page 723.)

Brictson Mfg. Co., W. O. W. Bldg., Omaha, Neb.

Bull Dog—See Iowa Tire Patch Co.

Bull Dog—See Poison Rubber Co.

Chicago Tire Goods Co., 1216 Webster Ave., Chicago, Ill. "Acme."

Cling-Tite—See American Rubber & Tire Co.

Continental Rubber Works, 1902 Liberty St., Erie, Pa. "Vitalic."

Cord-Wyckoff Tire & Rubber Co., 416 Douglas St., Sioux City, Ia.

Dannenhirsch Co., 1905 W. Dauphin St., Philadelphia, Pa. "Danno"

Danno—See Dannenhirsch Co.

Diamond Holdfast Patch Co., 10 Auburn Ave., Atlanta, Ga.

Double Fabric Tire Co., 60 W. Ninth St., Auburn, Ind.

Durkee-Atwood Co., Minneapolis, Minn. "Rie-Nie."

Eastern Rubber Co., 1529 Ridge Ave., Philadelphia, Pa. "Magic."

Empire Rubber & Tire Co., Mulberry St. & Clinton Ave., Trenton, N. J.

Endurance Tire & Rubber Co., New Brunswick, N. J. "Enduryte," "Endurlastic."

Endurlastic—See Endurance Tire & Rubber Co.

Enduryte—See Endurance Tire & Rubber Co.

Everloc—See Wood Co.

Falls Rubber Co., Cuyahoga Falls, O.

Federal Rubber Co. (Cudahy), Milwaukee, Wis.

Firestone Tire & Rubber Co., Miller & Sweitzer Aves., Akron, O.

Fisher Mfg. Co., 1530 N St., Lincoln, Neb.

Ford & Lyon, Prichard St., Fitchburg, Mass.

4-A Products Co., Charles Bldg., Denver, Colo. "Zip."

General Tire & Rubber Co., E. Market St., Akron, O.

Goodrich Co., B. F., S. Main St., Akron, O.

Goodyear Tire & Rubber Co., Akron, O. (See page 861.)

Hall-Thompson Co., Hartford, Conn. "Vulco-Visco." (See page 739.)

Hastee—See Johnson & Son.

Horsey Products Co., 1426 Addison Rd., Cleveland, O.

Indiana Rubber & Insulated Wire Co., Jonesboro, Ind.

Iowa Tire Patch Co., Des Moines, Ia. "Bull Dog."

Jackson-Eno Rubber Co., 1010 S. Main St., Los Angeles, Cal. "Peerless."

Jiffy—See Braender Rubber & Tire Co.

Jiffy—See Johnstown Rubber Co.

Johnson & Son, S. C., 1012 16th St., Racine, Wis. "Hastee."

Johnstown Rubber Co., Johnstown, Pa. "Jiffy."

Keystone Rubber Mfg. Co., Erie, Pa.

Lee Tire & Rubber Co., 245 W. 55th St., New York, N. Y.

Legnard & Co., A. B., Sheridan Rd. & Madison St., Waukegan, Ill.

Locktite Patch Co., 1028 Bellevue Ave., Detroit, Mich.

Lox-It—See Superior Fabric Patch Co.

M. & M. Mfg. Co., Lime & Western Aves., Akron, O. "Stick-Tite."

McCandless & Son Mfg. Co., A. C., 255 N. Market St., Wichita, Kans.

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FORD—
SATISFACTION

can only be obtained by using a HIGH - GRADE LIGHTING SYSTEM at a popular price, that nets you a good profit. We use a 6 volt 80 ampere high-grade battery, battery box, ammeter, large double bulb head-lights, taillights, and the easiest running generator that will keep up battery to greatest efficiency. Entire system complete, ready for installation. Triangular drive.

TRUCK-UNITS, 1½ ton capacity guaranteed, for Fords, Chevrolets, and other cars, can be furnished by us promptly at $350.00, minus discount. Write for discount and literature.

THE ITA MANUFACTURERS
Glen Ellyn ILLINOIS

ANDERSON AUTOREELITE
PATENTED

THE 3-IN-1LAMP

Spot-light Trouble-light Portable-light

With the Anderson "Autoreelite" on your car you need have no fear of a breakdown on the road after dark.

To use as a "trouble-light" simply unscrew the knurled nut and withdraw the lamp to the desired length. 12 feet of Electric Cord on an automatic reel. Cord winds and unwinds like a curtain roller.

Cat. No.	(With rear-view mirror)	Price
3140	Model B-6 21 c.p.	$8.00
3141	Model B-7 30 c.p.	$9.00

ANDERSON ELECTRIC SPECIALTY CO.
118-124 S. Clinton St. Chicago, Ill.

Jobbers—Dealers

Correspond with us now for our **1918** proposition on

PERMA-LOC PRODUCTS

which includes

Fabric Patch
Radiator Cement
Valve Grinding Compound
Carbon Remover
Radiator Cleaning Compound
Anti - Freeze, Etc.

MY HELP IS YOURS

We help you "*Over the Top*," giving every assistance in the way of advertising as well as other co-operation.

Perma-Loc Mfg. Co.

The House of Quality and Quick Service

FACTORY Wilkes Barre, Pa.
SALES OFFICE Scranton, Pa.

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PATCHES, Tire Repair (Continued)

Magic—See Eastern Rubber Co.
Manhattan Rubber Mfg. Co., Willett St., Passaic, N. J.
Mattson Rubber Co., Lodi, N. J.
Michelin Tire Co., Milltown, N. J.
Miller, Chas. E., 1400 S. Meridian St., Anderson, Ind.
Miller Rubber Co., Dept. A43, Akron, O. (See page 705.)
National Cement & Rubber Co., 300-16 S. St. Clair St., Toledo, O.
O'Neil—See Amazon Rubber Co.
One-Minute Vulcanizing Co., 23 E. 18th St., Kansas City, Mo. "Zip."
Ouachita Tire & Rubber Co., Monroe, La. "Styx."
Peerless—See Jackson-Eno Rubber Co.
Pennsylvania Rubber Co., Jeannette, Pa.
Perma-Loc Mfg. Co., Scranton, Pa. (See page 495.)
Permatite Mfg. Co., 67 Fifth Ave., N. E., Minneapolis, Minn.
Phoenix Laboratories, 704 Polk St., San Francisco, Cal. "Apache."
Poison Rubber Co., 1423 Kansas St., Kansas City, Mo. "Bull Dog."
Portage Rubber Co., Barberton, O.
Pronto Mfg. & Sales Co., 614-15 Paxton Blk., Omaha, Neb.
Quaker City Rubber Co., 629 Market St., Philadelphia, Pa.
Quick-Tite Patch Co., 20 Market St., Amsterdam, N. Y.
Racine Rubber Co., Racine, Wis.
Rie-Nie—See Durkee-Atwood Co.
S-V—See Williams Mfg. Co.
Security Co., 56 Terminal Way, Pittsburgh, Pa.
Spencer Co., W. E., 1 Park Pl., New York, N. Y. "Vulpa."
Stick-Tite—See M. & M. Mfg. Co.
Stitch-in-Time—See Wood Co.
Stuck-Tight—See Auto Supply Mfg. Co.
Styx—See Ouachita Tire & Rubber Co.
Superior Fabric Patch Co., Midlothian, Tex. "Lox-It."
Taxin—See Advance Auto Accessories Corp.
Tingley & Co., Chas. O., 21 St. Georges Ave., Rahway, N. J.
Twentieth Century Tire Protector Co., Midlothian, Tex.
Tyer Rubber Co., Andover, Mass. "Tyrian."
Tyrian—See Tyer Rubber Co.
United States Tire Co., Broadway & 58th St., New York, N. Y. (See page 695.)
Vitalic—See Continental Rubber Works.
Voorhees Rubber Mfg. Co., 18-46 Bostwick Ave., Jersey City, N. J. "Arlington."
Vul-Tex Mfg. Co., 140 E. Lake St., Minneapolis, Minn.
Vulco-Visco—See Hall-Thompson Co.
Vulkless—See American Automobile Accessories Co.
Vulpa—See Spencer Co.
Vultite Rubber Co., Bridgeport, Conn.
Williams Mfg. Co., 18th & Carman Sts., Camden, N. J. "S-V."
Wood Co., W. C., 74 Western Ave., Minneapolis, Minn. "Everloc," "Stitch-in-Time."
Yatman Rubber Co., 267-69 Mt. Pleasant Ave., Newark, N. J.
Zip—See 4-A Products Co.
Zip—See One-Minute Vulcanizing Co.

PATCHES, Top

(For repairing mohair or other fabric tops)

Auto Products Mfg. Co., Buffalo, N. Y. "Rub-R-Tite." (See page 255.)
Cementon—See Perkins-Campbell Co.
Cincinnati Auto Specialty Co., 426 Elm St., Cincinnati, O. "Stik-Tite."
Perkins-Campbell Co., 634 Broadway, Cincinnati, O. "Cementon." (See page 227.)
Rub-R-Tite—See Auto Products Mfg. Co.
Stik-Tite—See Cincinnati Auto Specialty Co.

PATCHING CEMENT—See Cement, Tire Repair

PATTERN MAKERS

Acme Pattern & Machine Co., 1553-59 Niagara St., Buffalo, N. Y.
Acme Pattern Works, 9 Woodward Ave., Detroit, Mich.
Banner Pattern Co., Columbus, O.
Beatty Co., J. M., Imperial-Power Bldg., Pittsburgh, Pa.
Bilt-Rite—See Keystone Pattern Works.
Buffalo Pattern Works, 13-17 Perry St., Buffalo, N. Y.
Cameron & Kaulfers Co., 56 Marshall St., Elizabeth, N. J.
Central Pattern Works, Canton, O.
Chester Pattern Co., Chester, Pa.
Des Moines Pattern & Model Works, 121 E. Walnut St., Des Moines, Ia.
Eastern Pattern Works, 28-32 Wight St., Detroit, Mich.
Eastern Production Co., 137 Leib St., Detroit, Mich. (See page 345.)
Elizabeth Pattern Works, Fourth & Livingston Sts., Elizabeth, N. J.
Eppenbach, Wm., 231 Vernon Ave., Long Island City, N. Y.
Forster Pattern Works, J. G., 148 S. Delaware St., Indianapolis, Ind.
Griffin & Co., Henry C., 143-54 Varick St., New York, N. Y.
Hartford Pattern & Model Co., 120 Allyn St., Hartford, Conn.
Hawkeye Pattern Works, 707 W. Second St., Davenport, Ia.
Hunter Co., Thomas J., 310-16 N. 11th St., Philadelphia, Pa.
Jacobsen & Co., K. F., 1218 Washington Ave., Racine, Wis.
Jurack Pattern Works, Chas., 199-201 Oregon St., Milwaukee, Wis.
Keystone Pattern Works, 1307 Jackson St., Omaha, Neb. "Bilt-Rite."
Messenger, George T., 609 W. Cambria St., Philadelphia, Pa.
Michigan Pattern Works, 1085-89 Jefferson Ave., E., Detroit, Mich.
Mt. Penn Pattern Works, 818 Court St., Reading, Pa.
Nesom & Wenz Co., 23 W. South St., Indianapolis, Ind.
Newark Stamping & Foundry Co., Newark, O.
Nobach Pattern Works, W. J., 411-13 S. Clinton St., Chicago, Ill.
Peerless Pattern Works, 1754 Main St., Buffalo, N. Y.
Peerless Pattern Works, 405 E. Madison St., South Bend, Ind.
Phillips, W. H., Exposition Bldg., Cambridge, Mass.
Remmers Pattern Co., 918-23 Benton St., St. Louis, Mo.

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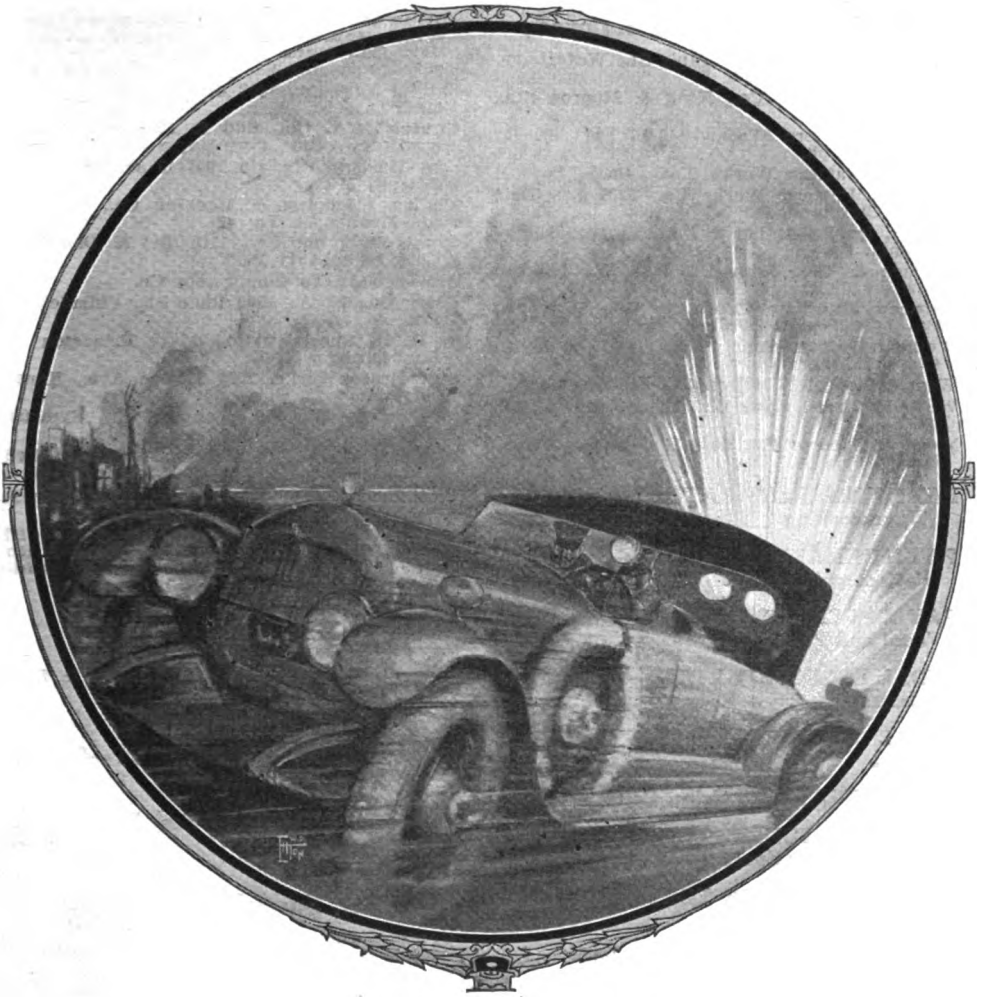

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DREDNAUT
Motor
Topping

"Defies Time and the Elements"

Durability is the essential quality often looked for in top material but rarely found. When Drednaut is used, an unequalled, weather-resisting, long-wearing top results.

More "Chase" material is used on vehicles today than any other brand.

L. C. CHASE & CO., BOSTON

NEW YORK DETROIT CHICAGO
SAN FRANCISCO

Leaders in Manufacturing Since 1847

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PATTERN MAKERS (Continued)

Reynolds & Currie, 141 Maple St., Waterbury, Conn.

Sandusky Pattern Co., King & Monroe Sts., Sandusky, O.

Standard Pattern Works, 144-46 Fort St. E., Detroit, Mich.

Standard Pattern Works, York, Pa.

Standard Pattern Works Co., 5337 St. Clair Ave., Cleveland, O.

Turner, Ira B., Amber & Dauphin Sts., Philadelphia, Pa.

Wallace & Co., John D., 1401 W. Jackson Blvd., Chicago, Ill.

Warren Machine Products Co., Warren, Pa. (See page 575.)

Wellman Pattern-Supply Co., 1444 E. 49th St., Cleveland, O.

West & Dodge, 167 Oliver St., Boston, Mass.

Whiteley Bros., 82-84 Church St., New York, N. Y.

Wood & Spencer Co., 1930 E. 61st St., Cleveland, O.

PATTERNMAKERS' LATHES—See Lathes, Woodworking

PATTERNMAKERS' VISES — See Vises, Patternmakers'

PAY CHECKS—See Checks, Brass Time, Tool and Pay

PEDAL ENGINE STARTERS—See Starters, Manual

PEDAL EXTENSIONS—See Extensions, Pedal

PEDAL GRIPS—See Grips, Pedal

PEDAL LATCHES FOR FORDS—See Latches, Low Speed Pedal

PEDAL LOCKS FOR FORDS—See Locks, Pedal

PEDAL PADS—See Grips, Pedal

PEDAL PLATES—See Plates, Heel, Pedal or Step

PEDAL STARTERS—See Starters, Manual

PEDALS, ACCELERATOR—See Pedals, Special Accelerator

PEDALS, ACCELERATOR, FOR FORDS—See Accelerators, Foot

PEDALS, CUT-OUT—See Pedals, Horn and Cut-Out

PEDALS, Horn and Cut-Out

Attwood Brass Works, Grand Rapids, Mich. (See page 531.)

Au-To Compressor Co., Wilmington, O. "Oro."

Barco Mfg. Co., 212-22 W. Illinois St., Chicago, Ill.

Cooper Mfg. Co.—See Fulton Co.

Cox Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y.

Eberhard Mfg. Co., 2734 Tennyson Rd., Cleveland, O.

Ewald—See Zinke Co.

Fulton Co., 1910 St. Paul Ave., Milwaukee, Wis. (Sole Distributors for Cooper Mfg. Co., Marshalltown, Ia.) (See page 139.)

Gabriel Mfg. Co., 1407 40th St., N. E., Cleveland, O.

Gemco Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. (See page 135.)

Gray-Hawley Mfg. Co., 937-43 Jefferson Ave., Detroit, Mich.

Medina Stamping & Machine Co., 317 Main St., Medina, N. Y.

Metal Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

Oro—See Au-To Compressor Co.

Petry Co., N. A., 1309 Race St., Philadelphia, Pa.

S. B. R. Specialty Co., 17-19 Princeton St., East Orange, N. J.

Star Brass Works, 2623 McGee Ave., Kansas City, Mo.

Stryker, C. W., 240 Shonnard St., Syracuse, N. Y.

Western Brass Mfg. Works, Marshall Blvd., 21st St. & C., B. & Q. R. R., Chicago, Ill.

Whitehouse-LeCompte Mfg. Co., 42-54 Elm St., Newark, N. J.

Zinke Co., 1323-25 Michigan Ave., Chicago, Ill. (Sole Distributors for Romort Mfg. Co., Oakfield, Wis.) "Ewald." (See pages 548 and 549.)

PEDALS, Motorcycle

Davis Sewing Machine Co., Linden & Davis Sts., Dayton, O.

Torrington Co., Torrington, Conn.

PEDALS, MUFFLER CUT-OUT—See Pedals, Horn and Cut-Out

PEDALS, RATCHET—See Pedals, Horn and Cut-Out

PEDALS, Special Accelerator

Gemco Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. (See page 135.)

Hackney—See Roller Bearing Foot Pedal Co.

Imperial Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill. "Imperial-Wixon." (See page 733.)

Imperial-Wixon—See Imperial Brass Mfg. Co.

Roller Bearing Foot Pedal Co., Fourth & Jackson Sts., St. Paul, Minn. "Hackney."

Star Brass Works, 2623 McGee Ave., Kansas City, Mo.

PENNANT HOLDERS—See Holders, Flag, Pennant and Emblem

PENNANTS AND FLAGS—See Flags, Pennants and Emblems

PET COCK OPENERS FOR FORDS—See Wrenches, Oil Cock

PET COCKS—See Cocks

PHOSPHORESCENT COMPOUNDS—See Paints, Luminous

PHOSPHORESCENT PAINTS—See Paints, Luminous

PICKING MACHINES—See Machines, Hair Picking

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Stewart
Automobile Accessories

Stewart Speedometer $25
Ford Model with Instrument Board $12

Stewart Lens Per Pair $2

Stewart V-Ray Searchlight $5

Stewart Autoguard $9.00; West. Price, $9.75. Model for Fords, $7.50; West. Price, $8.25. Rear Autoguard Tire-carrier for Fords, $11.50; Western Price, $12.50.

Every Progressive Dealer Sells Them

YOU can scarcely find a live, up-to-the-minute dealer who does not sell Stewart Automobile Accessories.

In opening an accessory department, the first thing a dealer does is stock Stewart Automobile Accessories.

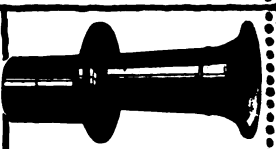
No stock of accessories is complete without them. No dealer can make the most profits on the sale of accessories without them.

Stewart Automobile Accessories are as staple with the auto accessory dealer and garageman as sugar and flour are with the grocer. It is simply a matter of supplying a demand which already exists—a demand which continues to grow year after year.

Stewart Automobile Accessories are known everywhere—sold everywhere—in demand everywhere.

They are the most widely advertised and most universally used of all automobile accessories. And this, because they are the best. There are none better sold at any price.

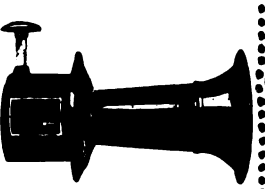
Dealers take satisfaction in selling Stewart Products. There are no "come-backs." The dealer does not have to give his personal guarantee. The largest automobile accessory factory and the largest service station organization stands back of Stewart Automobile Accessories.



Stewart Motor Driven Warning Signal $6

Stewart V-Ray Spark Plug $1

Stewart Vacuum System $10



Stewart Hand Operated Warning Signal $3.50

Stewart-Warner Speedometer Corporation
Chicago, U. S. A.

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PICNIC TABLES—See Tables, Picnic and Lunch

PINIONS, FIBRE—See Gears and Pinions, Rawhide

PINIONS, METAL—See Gears and Pinions, Metal

PINIONS, RAWHIDE—See Gears and Pinions, Rawhide

PINIONS, SPEEDOMETER—See Gears and Pinions, Speedometer

PINS, Cotter

American Chain Co., Bridgeport, Conn. "Campbell." (See page 369.)
American Cotter Pin Co., Park Bldg., Pittsburgh, Pa. "Kelkotters."
Brewer-Tichener Corp., 115 Port Watson St., Cortland, N. Y. "May's."
Brooks & Sons, M. S., Chester, Conn.
Campbell—See American Chain Co.
Cobb & Drew, Plymouth, Mass.
Detroit Bolt & Hardware Co., 45-49 Adelaide St., Detroit, Mich.
Efficiency—See Ohio Wire Goods Mfg. Co.
Hindley Mfg. Co., John St., Valley Falls, R. I.
Hobbs Mfg. Co., 26 Salisbury St., Worcester, Mass.
Hubbard Spring Mfg. Co., Pontiac, Mich. (See page 781.)
Jenckes Mfg. Co., E., 28 Union St., Worcester, Mass.
Kelkotters—See American Cotter Pin Co.
McWhorter Mfg. Co., Riverton, N. J.
May's—See Brewer-Tichener Corp.
National Screw & Tack Co., Cleveland, O. (See page 477.)
Ohio Wire Goods Mfg. Co., 964 Hazel St., Akron, O. "Efficiency."
Saco—See Smith & Co.
Smith & Co., F. P., 114 Railroad Ave., Sharon Hills, Pa. "Saco."
Western Wire Products Co., Third & Spruce Sts., St. Louis, Mo.
Whitaker Mfg. Co., 409 S. Green St., Chicago, Ill.
Whitman & Barnes Mfg. Co., E. Exchange St., Akron, O.
Wire Goods Co., 28 Union St., Worcester, Mass.

PINS, DRIFT—See Punches, Center, Prick and Drift

PINS, Escutcheon

American Steel & Wire Co., Chicago, Ill. (See page 203.)
Atlas Tack Co., Fairhaven, Mass.
Blake & Johnson Co., Waterbury, Conn.
Corbin Screw Corp., High St., New Britain, Conn.
Eagle—See Plume & Atwood Mfg. Co.
Hassall, John, Clay & Oakland Sts., Brooklyn, N. Y. (See page 725.)
Plume & Atwood Mfg. Co., 470 Bank St., Waterbury, Conn. "Eagle."
Star—See Turner & Seymour Mfg. Co.
Turner & Seymour Mfg. Co., Torrington, Conn. "Star."
Waterbury Mfg. Co., 568 Main St., Waterbury, Conn.
Wire Goods Co., 28 Union St., Worcester, Mass.

PINS, Piston

(See also Machine Work; also Screw Machine Products)

Ashley Machine Works, 724 University Ave., Rochester, N. Y.
Butler Mfg. Co., 1120-24 E. Georgia St., Indianapolis, Ind.
Detroit Tool Co., 1489 St. Antoine St., Detroit, Mich.
Green Engineering Co., Fourth & St. Clair Sts., Dayton, O.
Houpert Machine Co., Harris Ave. & Marion St., Long Island City, N. Y. (See page 491.)
Peninsular Milled Screw Co., 1090 Lafayette St., E., Detroit, Mich.
Spacke Machine & Tool Co., Indianapolis, Ind. (See page 427.)
Wainwright Engineering Corp., Connersville, Ind. (See page 479.)
Waterbury Welding Co., 1147 South Main St., Waterbury, Conn. (See page 243.)
Wilcox Motor & Mfg. Co., Saginaw, Mich. (See page 585.)
Wisconsin Machinery & Mfg. Co., 51st & Burnham Sts., Milwaukee, Wis.

PINS, Piston, for Fords

(Including both regular and special light weight pins)

Acme Mfg. Co., Boonton, N. J.
Bridgers Co., J. D., Irby & Front Sts., Florence, S. C.
Hill-Smith Metal Goods Co., Dept. H, Boston, Mass. (See page 221.)
Spencer Metal Products Co., Spencer, O.

PINS, Taper

Belvidere Screw & Machine Co., Belvidere, Ill.
Cassady-Fairbank Mfg. Co., 6106-30 La Salle St., Chicago, Ill.
Chicago Nut Co., 2513-39 W. 20th St., Chicago, Ill.
Chicago Screw Co., Homan Ave. & Fillmore St., Chicago, Ill. (See pages 593 and 601.)
Corbin Screw Corp., High St., New Britain, Conn.
Detroit Bolt & Hardware Co., 45-49 Adelaide St., Detroit, Mich.
Detroit Screw Works, 368 Franklin St., Detroit, Mich.
Ferry Cap & Set Screw Co., 2155 Scranton Rd., Cleveland, O. (See page 595.)
Hartford Machine Screw Co., Hartford, Conn. (See page 513.)
Morse Twist Drill & Machine Co., New Bedford, Mass.
National Sewing Machine Co., Belvidere, Ill.
Peninsular Milled Screw Co., 1090 Lafayette St., E., Detroit, Mich.
Pratt & Whitney Co., 111 Broadway, New York, N. Y. (See page 73.)
St. Louis Screw Co., Clarence & Bulwer Aves., St. Louis, Mo.
Screw Machine Products Corp., 1012 Eddy St., Providence, R. I.
Standard Tool Co., 6900-34 Central Ave., Cleveland, O.
U. S. Automatic Co., Amherst, O.
Western Automatic Machine Screw Co., 750 Lake Ave., Elyria, O. (See page 475.)

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Spicer Universal Joints

Universally Accepted as the Most Dependable Flexible Connection Known to Motor Car Practice.

Grease-Tight *Dust-Proof*

Parts Interchangeable

SPICER MFG. CORP., South Plainfield, N. J.

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L. D. BOLTON
2215 Dime Savings Bank Bldg., Detroit

A. H. COATES
41 Spear Street, San Francisco, Cal.

Foreign: BENJAMIN WHITTAKER, 21 State Street, New York

BRAKE LINING

is so constructed that it becomes proof against the action of oil—grease—water—wind or dust—and has an extra long life against the constant wear to which a brake lining is subjected.

Wearwell Gasket & Packing Company

General Office & Factory: Camden, N. J.

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PINS, Valve Stem, for Fords

Nelson Mfg. Co., A., 2700 Southport Ave., Chicago, Ill.

PIPE, BRASS—See Tubing, Brass and Copper

PIPE FITTINGS—See Fittings, Pipe

PIPE VISES—See Vises, Pipe

PIPE WRENCHES—See Wrenches, Pipe

PIPES, BREATHER, FOR FORDS — See Breathers, Crank Case

PIPING, EXHAUST AND INTAKE—See Manifolds, Exhaust

PISTON PIN BUSHINGS FOR FORDS—See Bushings, Bronze

PISTON PINS—See Pins, Piston

PISTON RING COMPRESSING TOOLS—See Tools, Piston Ring

PISTON RING GRINDERS—See Grinders, Piston Ring

PISTON RING TOOLS—See Tools, Piston Ring

PISTON RINGS—See Rings, Piston

PISTON VISES FOR FORDS—See Vises, Piston

PISTONS, Finished and Machined

(For Piston Castings—See Castings)

Abcilium—See Brass & Bronze Castings Co.

Acieral Co. of America, 26 Cortlandt St., New York, N. Y. (See page 839.)

Allen & Curtiss Co., W. Main St., Benton Harbor, Mich.

Aluminite—See Green Engineering Co.

Aluminum Castings Co., Cleveland, O. "Lynite." (See page 157.)

Auto Engine Works, University Ave. & Griggs St., St. Paul, Minn.

Brass & Bronze Castings Co., 6515 Carnegie Ave., S. E., Cleveland, O. "Abcilium."

Butler Mfg. Co., 1120-24 E. Georgia St., Indianapolis, Ind.

Dall Motor Parts Co., Vermilion, O.

Detroit Auto Piston Co., 180-84 John R. St., Detroit, Mich.

Detroit Foundry Co., N. Grand Blvd. & Riopelle St., Detroit, Mich.

Ferro Machine & Foundry Co., 47 Hubbard Ave., Cleveland, O.

Green Engineering Co., Fourth & St. Clair Sts., Dayton, O. "Aluminite."

Houpert Machine Co., Harris Ave. & Marion St., Long Island City, N. Y. (See page 491.)

Lawrie Co., Fred'k S., Odd Fellows Bldg., Indianapolis, Ind. (Sales Agents.) (See page 867.)

Levett Co., Walker M., 417-21 E. 23rd St., New York, N. Y. "Magnalite." (See page 505.)

Lynite—See Aluminum Castings Co.

McCadden Machine Works, St. Cloud, Minn.

Magnalite—See Levett Co.

Miller Mfg. Co., Harry A., 219 E. Washington St., Los Angeles, Cal.

Modern Electric & Machine Co., 936-40 Fort Wayne Ave., Indianapolis, Ind. "R. & M. Maluminum."

Precision Auto Parts Co., 244 W. 49th St., New York, N. Y.

R. & M. Maluminum—See Modern Electric & Machine Co.

Spacke Machine & Tool Co., Indianapolis, Ind. (See page 427.)

Spencer-Smith Machine Co., Howell, Mich.

Wainwright Engineering Corp., Connersville, Ind. (See page 479.)

Waterbury Welding Co., 1147 South Main St., Waterbury, Conn. (See page 243.)

Whitman Luvium Metal Mfg. Co., 6900 S. Broadway, St. Louis, Mo.

Wisconsin Machinery & Mfg. Co., 51st & Burnham Sts., Milwaukee, Wis.

Wridgway Co., Scranton, Pa. "Zephyr." (See page 503.)

Zephyr—See Wridgway Co.

PISTONS, Special Light Weight, for Fords

(Including aluminum and aluminum alloy pistons)

American Machine Products Co., Marshalltown, Ia. "Ampeco." (See page 523.)

Ampeco—See American Machine Products Co.

Butler Mfg. Co., 1120-24 E. Georgia St., Indianapolis, Ind.

Dall Motor Parts Co., Vermilion O.

Doane Machine Co., Waltham, Mass.

Depuy Bros., Canterbury, N. H.

Dyer Co., G. H., Cambridge, Mass. (See page 505.)

Ferrolyte—See Perfection Auto Parts Co.

K-P—See Keys Piston Ring Co.

Keys Piston Ring Co., 3020 Olive St., St. Louis, Mo. "K-P." (See page 597.)

Levett Co., Walker M., 417-21 E. 23d St., New York, N. Y. (See page 505.)

Lynite—See McQuay-Norris Mfg. Co.

M & P Co., Saranac Lake, N. Y.

McCadden Machine Works, St. Cloud, Minn.

McQuay-Norris Mfg. Co., Dept. G, St. Louis, Mo. "Lynite." (See page 583.)

Magnelite—See Sunderland Machinery Co.

Modern Electric & Machine Co., 936-40 Fort Wayne Ave., Indianapolis, Ind. "R & M Maluminum."

Noonan, D. R., 220 W. Washington St., Paris, Ill.

Perfection Auto Parts Co., 404 Lakeside Ave., N. W., Cleveland, O. "Ferrolyte." (See page 493.)

R & M Maluminum—See Modern Electric & Machine Co.

Spencer Metal Products Co., Spencer, O.

Sunderland Machinery Co., Omaha, Neb. "Magnalite." (See page 243.)

Turko—See Turnbull Mfg. Co.

Turnbull Mfg. Co., Wilmington, O. "Turko."

Whitman Luvium Metal Mfg. Co., 6900 S. Broadway, St. Louis, Mo.

PLANER CHUCKS—See Chucks, Planer

PLANER TOOL HOLDERS—See Holders, Lathe and Planer Tool

PLANER TOOLS—See Tools, Lathe and Planer

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ZEPHYR PISTONS

The "Zephyr" Piston is recognized abroad as chief factor in developing greater efficiency and used entirely by the leading car and aeroplane manufacturers, including Rolls-Royce, Vauxhall, etc.

If you keep the following facts in mind you will see that there are strong arguments that can be used in favor of replacement with "Zephyr" Pistons, either at once or when repairs offer opportunity.

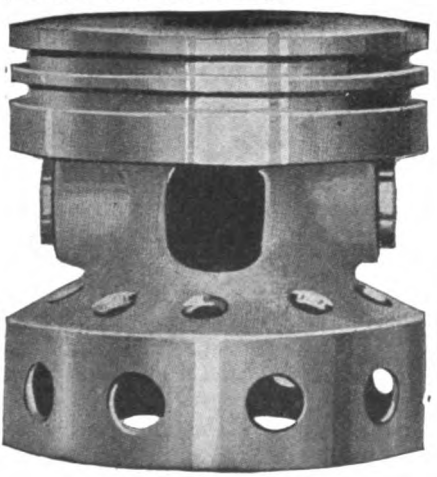
"Zephyr" Pistons give greater economy in operation.

They eliminate engine vibration.

They make hill climbing easier and stop overheating.

They do away with carbonization and sooting spark plugs.

They reduce wear on bearings.



The "Zephyr" Piston is the LIGHTEST and STRONGEST Piston in the World, Made in Lynite, Magnalite or Iron

Prices on Application

THE WRIDGWAY COMPANY, Scranton, Pa.

Sole Licensees for America for the "Zephyr" Piston U. S. Patent No. 975,301

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PLANERS, Metal

American Tool Works Co., Sixth & Eggleston Sts., Cincinnati, O.

Bartlett, Edwin E., 41 Crown St., Nashua, N. H. "Federal."

Cincinnati Planer Co., Cincinnati, O.

Cincinnati Shaper Co., Elam St. & Garrard Ave., Cincinnati, O.

Duff, William E., York, Pa. (Dealer.) (See page 457.)

Federal—See Bartlett, Edwin E.

Gray Co., G. A., Gest & Depot Sts., Cincinnati, O.

Hamilton Machine Tool Co., Symmes Ave., Hamilton, O.

Lapointe Co., J. N., Hudson, Mass.

Niles-Bement-Pond Co., 111 Broadway, New York, N. Y. "Pond."

Ohio Machine Tool Co., Kenton, O.

Pond—See Niles-Bement-Pond Co.

Putnam Machine Co., Newton Pl., Fitchburg, Mass.

Rockford Machine Tool Co., Kiswaukee & 23rd Sts., Rockford, Ill.

Stapf & Co., John B., Dunkirk, N. Y.

Whitcomb-Blaisdell Machine Tool Co., 134 Gold St., Worcester, Mass.

Woodward & Powell Planer Co., Webster St. & B. & A. R. R., Worcester, Mass.

PLANES, SEA—See Section I

PLANETARY GEARS—See Gears, Transmission

PLATE GLASS—See Glass, Polished Plate

PLATES, Aeroplane Wing Socket

Barcalo Mfg. Co., 225 Louisiana St., Buffalo, N. Y.

PLATES, Demountable Rim Wedge

(Small stamped Plates or Shims to be used under rim wedges to ensure their tightness)

Alliance Supply Mfg. Co., 153 E. State St., Alliance, O.

PLATES, Heel, Pedal or Step

Spiro Mfg. Co., C., 68-72 E. 131st St., New York, N. Y.

Stanwood Equipment Co., 307 Plymouth Ct., Chicago, Ill.

PLATES, Name

American Name Plate & Engraving Co., 352 Atlantic Ave., Boston, Mass.

Auld Co., D. L., 195-97 Long St., E., Columbus, O. (See page 781.)

Bastian Bros. Co., 69 Mt. Hope Ave., Rochester, N. Y.

Blackinton & Co., V. H., Attleboro Falls, Mass.

Bernard Co., J., 422-30 E. 53d St., New York, N. Y.

Buckeye Iron & Brass Works, 324 E. Third St., Dayton, O.

Chandler Co., Napier St., Springfield, Mass.

Childs & Co., S. D., 136 S. Clark St., Chicago, Ill.

Chippewa Bronze Co., 1469 E. 118th St., Cleveland, O.

Colgan Co., J. W., Sudbury Bldg., Boston, Mass.

Crowe Name Plate & Engraving Co., Chicago, Ill. (See page 461.)

Electro-Chemical Engraving Co., 450 19th St., Brooklyn, N. Y.

Etching Company of America, 2526-28 W. Congress St., Chicago, Ill.

Federal Name Plate & Novelty Co., 732 Federal St., Chicago, Ill.

Fox Co., Gustave, 411-13 Race St., Cincinnati, O.

Greenduck Co., Van Buren & Hoyne Aves., Chicago, Ill.

Haeusermann Metal Mfg. Co., 1098-1102 Brook Ave., New York, N. Y.

Hanson Co., C. H., 178 N. Clark St., Chicago, Ill.

Highton & Sons Co., Wm., Nashua, N. H.

Imperial Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill. (See page 733.)

Matthews & Co., James H., Pennant Way, Pittsburgh, Pa.

Mayer Co., Geo. J., 36 S. Meridian St., Indianapolis, Ind.

Murdock, Jr., Co., Jas., 116 Opera Pl., Cincinnati, O.

Ness, Jr., Geo. M., 61 Fulton St., New York, N. Y.

New York Stencil Works, 100 Nassau St., New York, N. Y.

O'Connor, James, Nevada Bldg., Cincinnati, O.

Premier Metal Etching Co., 617-21 E. 18th St., New York, N. Y.

Robbins Mfg. Co., John, 58 Kneeland St., Boston, Mass.

Smith & Co., Jos. N., E. Grand Blvd., & Dubois St., Detroit, Mich.

Stafford Co., N., 87 Fulton St., New York, N. Y.

Turner Brass Works, Sycamore, Ill.

Walter & Sons, N. C., 3 Park Row, New York, N. Y.

Watson Co., Mechanics St., Attleboro, Mass.

Whiteford & Co., Jos. G., 165 N. Jefferson St., Chicago, Ill.

Whitehead & Hoag Co., 272 Sussex Ave., Newark, N. J.

Wright & Son, Greg. G., 119-21 Opera Pl., Cincinnati, O.

Yeuell Co., E. V., Middlesex Ct., Malden, Mass.

PLATES, PEDAL—See Plates, Heel

PLATES, Robe Monogram or Initial

(Small metal plate with initial or monogram to fasten to robe)

Parks Mfg. Co., 236 Aborn St., Providence, R. I.

PLATES, SCREW—See Taps and Dies

PLATES, STEP—See Plates, Heel

PLATES, Tractor Quick Detachable Wheel Rim Extension

Loxon—See Universal Lug Co.

Universal Lug Co., 1401 S. 55th St., Cicero, Ill. "Loxon."

PLATING, Brass and Nickel

Ajax Plating & Specialty Mfg. Co., 1400 Niagara St., Buffalo, N. Y.

American Chain Co., Bridgeport, Conn. (See page 369.)

Bernard Co., J., 422-30 E. 53d St., New York, N. Y.

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Manufacturers of

Pistons (Several hundred patterns in stock)
Garage Equipment
Special Tools for Ford Work
Oxy-Acetylene Welding and Cutting Apparatus
Carbon Removing Outfits
Lead Burning Outfits
Brazing and Soldering Outfits

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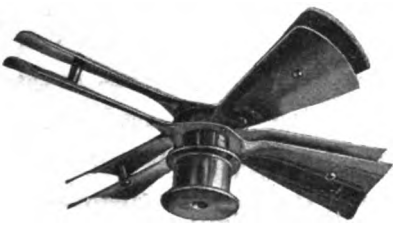
CAMBRIDGE, MASS.

PITTER MULTIBLADE FAN



Pitter Multiblade Fan will positively prevent Ford motor overheating.

Patented in the U. S., Canada, Great Britain, France. We guarantee that a demonstration will prove this to be the most efficient fan on the market.

"With the same current consumption these blades move about 30% to 40% more air than a flat blade of the same diameter."
—General Electric Company, Ltd., London.

We will save on radiation more than the entire cost of the fan.

Send us your cooling problem, we will solve it.

Ford Size made in 12", the same as the 15" diameters carried in stock.

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CHICAGO ILLINOIS

"The [illegible] that means [illegible] mark the most"

PRESSED STEEL PARTS

WE SPECIALIZE IN A SERVICE

the essentials of which are **Quality** parts, made from **good materials,** produced by **skilled workmen and delivered promptly.**

We solicit your inquiries.

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Lansing, Michigan

Detroit Representative — **H. B. Kendal, 56 Cadillac Square**

LEVETT PISTONS and RODS of MAGNALITE (ALUMINUM ALLOY)

are specially made for Ford cars. They wonderfully reduce vibration—give more power on the hills—and produce marked acceleration and increased speed.

Levett pistons and rods are cast in the famous Levett metal, used for years by the most prominent racing drivers such as Ralph Mulford, Dario Resta, de Palma, Rickenbacher, Aitken, the Chevrolets, Hearne. Now used as standard by the most prominent automobile and aeroplane engine manufacturers.

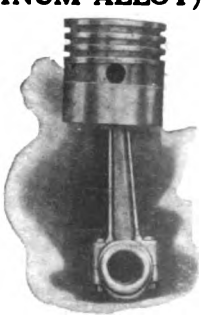
Levett pistons for Ford cars are made in two sizes, viz.: "Standard" size 3.750 inches and "Oversize" 3.781 inches.

Old wrist pins and piston rings may be used on Levett pistons with perfect satisfaction, if they are not worn excessively.

PRICES
F. O. B. NEW YORK
Finished Parts

1 complete assembly (4 pistons and 4 connecting rods) $39
1 complete set of pistons (only) 24
1 complete set of connecting rods (only) with bolts and laminated shims 17

Sizes—Standard size (3.750 inches).
Over size (3.781) inches.
IMPORTANT—Be sure to state size of piston desired when ordering.



WALKER M. LEVETT COMPANY, 417-419-421 East 23rd Street, NEW YORK

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PLATING, Brass and Nickel (Continued)

Boesch Lamp Co., 1135 Mission St., San Francisco, Cal.

Boston Nickel Plating Co., 160 Portland St., Boston, Mass.

Brown Mfg. Co., W. G., Kingston, N. Y.

Cheney & Son, S., Manlius, N. Y.

Creutz Plating Co., Fifth & Elm Sts., Cincinnati, O.

Detlaff, A. J., 121 E. Lafayette Ave., Detroit, Mich.

Erie Metal Products Co., Erie, Pa. (See page 523.)

Exeter Brass Works, Exeter, N. H.

Fitchburg Plating Works, rear 2 Main St., Fitchburg, Mass.

Hillman Auto Supply Mfg. Co., 98 Massachusetts Ave., Boston, Mass.

Holt & Beebee Co., 106 Brookline Ave., Boston, Mass.

Hoosier Auto Parts Co., 718 S. Elliott St., Muncie, Ind.

Johnson Bronze Co., Mill St., New Castle, Pa.

Keyless Lock Co., 1401 Newman St., Indianapolis, Ind.

Lynam Electrical & Plating Co., Wm., Dakota & Kilmer Sts., Dayton, O.

McKenna Brass & Mfg. Co., First Ave. & Ross St., Pittsburgh, Pa. (See page 481.)

Maforco—See Market Forge Co.

Market Forge Co., Garvey St. & Blvd., Everett, Mass. "Maforco."

Metropolitan Mfg. Co., Oakman Ave. & Detroit Terminal R. R., Detroit, Mich. (See page 641.)

Monarch Stamping Co., Chappaqua, N. Y.

Nehls Plating Works, 248 Brush St., Detroit, Mich.

Rockford Metal Specialty Co., 720 S. Main St., Rockford, Ill.

Tuttle & Bailey Mfg. Co., 52 Vanderbilt Ave., New York, N. Y.

Villinger Mfg. Co., 643 Elmira Ave., Williamsport, Pa.

Voelkner & Harry Mfg. Co., 282-92 Woodbridge St., E., Detroit, Mich.

Whitehouse-Le Compte Mfg. Co., 42-54 Elm St., Newark, N. J.

PLATING COMPOUNDS—See Compounds, Chemical Plating

PLATING NICKEL—See Plating, Brass

PLATINUM POINTS—See Platinum; also Points, Sparking

PLATINUM RIVETS—See Platinum; also Points, Sparking

PLATINUM SCREWS—See Platinum; also Points, Sparking

PLATINUM, Sheet, Rod and Wire

(For contact screws, rivets and points—See also Points, Sparking. For Platinum substitutes—See Points, Sparking)

American Platinum Works, 225-31 N. J. R. R. Ave., Newark, N. J.

Baker & Co., Newark, N. J. (See page 507.)

Bishop & Co., Platinum Works, J., Malvern, Pa.

Commercial Research Co., Jackson Ave. & Honeywell St., Long Island City, N. Y.

Dee & Co., Thos. J., Mallers Bldg., Chicago, Ill.

Goldsmith Bros. Smelting & Refining Co., 29 E. Madison St., Chicago, Ill.

Platt Co., C. S., 29 Gold St., New York, N. Y.

R. & H. Platinum Works, 100 William St., New York, N. Y. (See page 507.)

Wilson Co., H. A., 97 Chestnut St., Newark, N. J.

PLIERS, Combination

American Forge & Machine Co., 1425 Barth Ct., Canton, O.

Athol Machine Co., Athol, Mass.

Barcalo Mfg. Co., 225 Louisiana St., Buffalo, N. Y.

Bergman Tool Mfg. Co., 1573-75 Niagara St., Buffalo, N. Y.

Bernard—See Scholhorn Co.

Billings & Spencer Co., Laurel & Park Sts., Hartford, Conn. "Hayden."

Bonney Vise & Tool Works, Allentown, Pa. (See page 293.)

Braunsdorf-Mueller Co., 205 Madison St., Elizabeth, N. J.

Buffum Tool Co., Louisiana, Mo. (See page 707.)

Cincinnati Tool Co., 1951 Waverly Ave., Norwood, O. "Hargrave."

Crescent Tool Co., 204 Harrison St., Jamestown, N. Y. "Simplex."

Cronk & Carrier Mfg. Co., Second National Bank Bldg., Elmira, N. Y.

Cushman Auto Tool Co., Nell & Green Sts., Champaign, Ill.

Dreadnaught—See Kraeuter & Co.

Eagle—See Mechanical Specialties Co.

Erie Tool Works, 640 W. 12th St., Erie, Pa.

Gittatit—See Smith & Co.

Goodell-Pratt Co., Greenfield, Mass. (See page 751.)

Graham Roller Bearing Co., Coudersport, Pa. "K. I. T."

Handee—See Racine Handy Mfg. Co.

Hargrave—See Cincinnati Tool Co.

Hayden—See Billings & Spencer Co.

Herbrand Co., Fremont, O.

Hjorth & Co., Wm., 28 Taylor St., Jamestown, N. Y.

Holmes, George L., 1733 Broadway, New York, N. Y. (Eastern Distributor for "K. I. T." and Barcalo Pliers. (See page 383.)

K. I. T.—See Graham Roller Bearing Co.

Kilborn & Bishop Co., Chapel & Lloyd Sts., New Haven, Conn.

Kraeuter & Co., 571-85 15th Ave., Newark, N. J. "Dreadnaught," "Victor."

Larock—See Mechanical Specialties Co.

McKaig Drop Forge Co., 14 Perry St., Buffalo, N. Y.

Mechanical Specialties Co., 122 S. Michigan Ave., Chicago, Ill. "Eagle," "Larock."

Mossberg Co., Frank, Attleboro, Mass. (See page 769.)

Osborne & Co., C. S., Harrison, N. J.

Oswego Tool Co., 119-27 W. First St., Oswego, N. Y.

Peck, Stow & Wilcox Co., Southington, Conn. "Pexto."

Pexto—See Peck, Stow & Wilcox Co.

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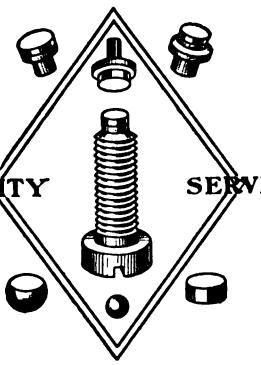
BAKER

Platinum



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IRIDIO-PLATINUM TIPPED SCREWS & RIVETS

What You Need, When You Need It

We carry all standard sizes of the best and most serviceable iridio-platinum heads securely welded on screws and rivets. We make—on short notice—any special style according to specification or degree of hardness.
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R. & H. Platinum Works
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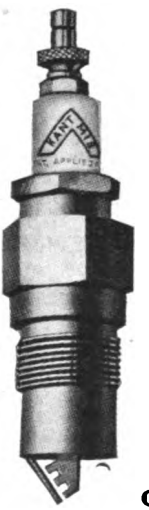
100 William St. New York — Factory Perth Amboy, N.J.

KANT MIS SPARK PLUG

Never Fails



The advantages of three spark plugs combined in *one* at the price of one.

The picture tells the story. Retail for $1.25 each. Write for discount to the trade.

Kant-Mis Spark Plug Co.
S. Washington Street
GREEN BAY WIS.

THE TEST OF TIME

For fourteen years Hoyt Meters have been recognized leaders in their field, and although production has increased by leaps and bounds, it has not kept pace with demand. From five employees in 1904 to one hundred and fifty in 1917 tells only part of the story. Special labor saving devices have more than tripled the individual efficiency of the producers.

Hoyt Elec. Inst. Works, Penacook, N.H.

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PLIERS, Combination (Continued)

Racine Handy Mfg. Co., 107 Fifth St., Racine, Wis. "Handee."

Red Devil—See Smith & Hemenway.

Redd Mfg. Co., Eighth St. & E. & P. Tracks, Erie, Pa.

S. & I. Co., 55-57 Governor St., Springfield, Mass.

Scholhorn Co., Wm., New Haven, Conn. "Bernard."

Shark—See Wakefield Mfg. Co.

Simplex—See Crescent Tool Co.

Smith & Co., H. D., Plantsville, Conn. "Gittatit."

Smith & Hemenway, 130 Cort St., Irvington, N. J. "Red Devil."

Starrett Co., L. S., Athol, Mass.

Syracuse Twist Drill Co., 936 Grape St., Syracuse, N. Y.

Victor—See Kraeuter & Co.

Vichek Tool Co., Cleveland, O.

Wakefield Mfg. Co., Wakefield, Neb. "Shark."

West Haven Mfg. Co., 22 Elm St. (West Haven), New Haven, Conn.

Whitaker Mfg. Co., 409 S. Green St., Chicago, Ill.

Worden, E. M., 215 Lake Ave., Ladysmith, Wis.

PLIERS, GAS—See Pliers, Combination

PLIERS, Tire Repair

National Cutlery Co., Westmoreland & Boudinot Sts., Philadelphia, Pa.

PLUG BRUSHES—See Brushes, Spark Plug

PLUG BUSHINGS—See Bushings, Spark Plug Testing

PLUG CASES—See Cases, Spark Plug

PLUG CLEANERS—See Cleaners, Spark Plug

PLUG GAGES—See Gages, Plug and Ring

PLUG SHIELDS FOR FORDS—See Shields, Spark Plug

PLUG SWITCHES—See Switches, Spark Plug

PLUG WRENCHES—See Wrenches, Nut and Bolt

PLUGS, Charging

Anderson Mfg. Co., Albert & J. M., 289 A St., Boston, Mass.

General Electric Co., Schenectady, N. Y. (See pages 564 and 565.)

Russell & Stoll Co., 48 Cliff St., New York, N. Y.

Universal Electric Stage Lighting Co., 240 W. 50th St., New York, N. Y.

Westinghouse Electric & Mfg. Co. (E. Liberty), Pittsburgh, Pa.

PLUGS, Core Hole

Hubbard Spring Mfg. Co., Pontiac, Mich. (See page 781.)

PLUGS, Spark

A. C.—See Champion Ignition Co.

A-scho—See Apex Co.

Air-Friction Carburetor Co., 1777 Broadway, New York, N. Y. (New York and New Jersey distributors for Air Friction Carburetors.) (See page 149.)

Air-Friction Carburetor Co., First & Madison Sts., Dayton, O.

Ajax—See Champion Spark Plug Co.

Albright Ignition Co., Columbus, Ga.

All-Weather Spark Plug Mfg. Co., Citizens Nat'l Bank Bldg., Des Moines, Ia.

Answer—See Hill Insulating & Mfg. Corp.

Apex Co., Evansville, Ind. "A-scho." (See page 517.)

Arc-O-Mfg. Co., 315 E. 33rd St., Chicago, Ill. "Arc-O-Fire."

Arc-O-Fire—See Arc-O-Mfg. Co.

Arrow—See Reflex Ignition Co.

Auburn—See New York Mica & Mfg. Co.

Auburn Ignition Mfg. Co., Auburn, N. Y. (See page 521)

Axwell Equipment Co., 214 Wood St., Pittsburgh, Pa.

B. A. T. Co., Germantown & Stenton Aves., Philadelphia, Pa. "Panther."

Baby—See Reflex Ignition Co.

Benford Mfg. Co., Box H, Mt. Vernon, N. Y. "Monarch," "Golden Giant." (See page 517.)

Benton Co., L. F., 300 Main St., Vergennes, Vt.

Bergie National Spark Plug Co., 214 E. State St., Rockford, Ill. "National."

Bethlehem—See Silvex Co.

Blazer—See Auburn Ignition Mfg. Co.

Blitz—See Randall-Faichney Co.

Blitzen—See Ideal Mfg. Co.

Blu Streak—See Cumming-Forster Corp.

Bosch Magneto Co., 223 W. 46th St., New York, N. Y.

Brown Co., 213 Bellevue Ave., Syracuse, N. Y.

Buettner Co., Charles H., Cincinnati, O.

Burnham Spark Plug Co., East Edgecomb, Me.

Chain-O-Spark Co., 1307 Nicollet Ave., Minneapolis, Minn.

Challenge Spark Plug Co., Crowley & Joliet Sts., Joliet, Ill.

Champion Ignition Co., Flint, Mich. "A. C.," "Titan," "Cico." (See page 517.)

Champion Spark Plug Co., 1616 Upton Ave., Toledo, O. "J-D," "Reliance," "Ajax," "Meteor," "Star," "Sta-Rite." (See page 509.)

Cico—See Champion Ignition Co.

Climax Specialty Co., 1122 Nostrand Ave., Brooklyn, N. Y.

Comet—See Oakes & Dow Co.

Common Sense—See Splitdorf Electrical Co.

Cumming-Forster Corp., 220 S. State St., Chicago, Ill. "Blu Streak."

D & D Co., 20 E. Jackson Blvd., Chicago, Ill.

Day, Geo. F., 21 Haverhill St., Boston, Mass.

De Luxe—See Lockwood-Ash Motor Co.

Delta Mfg. Co., Delancy St., Newark, N. J.

Derf Mfg. Co., 90 W. Broadway, New York, N. Y. (See page 513.)

Diamond—See Reflex Ignition Co.

Dodd, William Mfg. Co., 21 E. 40th St., New York, N. Y. "Dodwill."

Dodwill—See Dodd, William Mfg. Co.

Dow Mfg. Co., 131 Adams St., Braintree, Mass.

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Champion

Dependable Spark Plugs

All Champion Spark Plugs are guaranteed to give absolute satisfaction to the user, or full repairs or replacement will be made.

A15, ⅞ Inch

CHAMPION "X"

Adopted by the Ford Motor Co. as standard equipment on Ford cars since 1911.

The following is quoted from the instruction book in each Ford car.

"There is nothing to be gained by experimenting with different makes of plugs. The make of plugs with which Ford engines are equipped when they leave the factory are best adapted to the requirements of our motor."

Price, $0.75

J13 "O," ⅞ Inch

CHAMPION "O"

for

Overland Cars

The Overland factory equipment plug. Especially recommended to meet the requirements of the Overland motor. Also recommended for tractors, farm, stationary and marine engines and all automobiles where a standard ½-inch plug is used.

Price, $1.00

AA13, ⅞ Inch
A43, ⅞—18

CHAMPION

"Studebaker" for Studebaker Cars

Recommended for use in:

Allen	Liberty
Auburn	Mitchell
Dort	Paige-Detroit
Elgin	Saxon
Grant	Spaulding
Jordan	Stewart

And tractors, farm, stationary and marine engines where a standard ⅞—18 plug is used.

Price, $1.00

A44, ⅞—18

CHAMPION

"Maxwell" for Maxwell Cars

The Maxwell factory equipment plug.

Has the well-known patented Copper Asbestos gasket construction which does not allow any metal to touch the shoulders of the porcelain.

Price, $1.00

A53, Long, ⅞—18

CHAMPION

"Buick" for Buick and Chevrolet Cars

Has long shell, conical porcelain. The long shell allows the spark to ignite within the cylinder instead of in a pocket, as occurs when the ordinary type of plug is used.

Price, $1.00

J43, ⅞—18
J63, Metric

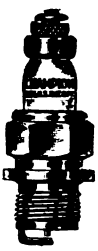
CHAMPION

"Heavy Duty" for Dodge Cars

Recommended for use in:

Apperson	Hupmobile
Briscoe	Jackson
Crow-Elkhart	King
Elcar	McFarlan
Franklin	Moaroe

Price, $1.00



G43, ⅞—18

CHAMPION

One Piece

"Heavy Stone"

Recommended for use in.

Moline-Knight
Murray
Owen
Stearns-Knight
Stutz
Willys-Six
Willys-Knight

And all Knight motors.

Price, $1.00

B13, ⅞ Inch
B43, ⅞—18
B63, Metric

CHAMPION

Two Piece

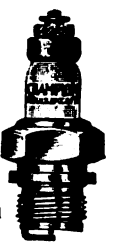
"Heavy Stone"

Recommended for use in:

Austin
Case
Fiat
Locomobile
Marmon
Stutz
White

And heavy service trucks and tractors.

Price, $1.00



JA43, ⅞—18

CHAMPION

"Heavy Duty" for Packard Cars

Recommended for use in:

Cadillac	Marmon
Chalmers	Mercer
Chandler	Oldsmobile
Cole	Packard
Doris	Peerless
Haynes	Pierce-Arrow
Hudson	Velie
Kissel-Kar	

Price, $1.00

TRADE PRICES

	QUANTITIES 10 to 99	100 Lots	500 Lots
Champion "Primsing" Plug	$0.80	$0.75	$0.70
Champion "Sparks in Water" Plug	.80	.75	.70
Champion "Tractor" Heavy Stone Plug	.61	.58	.56
Champion "Heavy Stone" Plug, one or two piece	.61	.58	.56
Champion "Aeroplane" and Motorcycle Plug	.61	.58	.56
Champion "Aeroplane" Plug for Trucks and Tractors	.61	.58	.56
Champion Motorcycle Mica Plug	.55	.53	.50
Champion "Heavy Duty" Plug, Packard type	.51	.49	.47
Champion "Heavy Duty" Plug, Dodge type	.51	.49	.47
Champion "O" Plug, Overland	.51	.49	.47
Champion "Maxwell" Plug	.51	.49	.47
Champion "Buick" Plug	.51	.49	.47
Champion "Extra Long", Metz	.51	.49	.47
Champion "Regular" Plug, Studebaker	.51	.48	.47
Champion "Reo" Plug	.51	.48	.47
Champion "X" Plug	.45	.43	.47

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PLUGS, Spark (Continued)

Eagle—See Janesville Products Co.
Eclipse Mfg. Co., 424 N. Meridian St., Indianapolis, Ind. "Hercules."
Eklips—See Fulton Co.
Express Spark Plug Co., 629 F St., N. W., Washington, D. C. "Firebrand."
Ezekleen—See Perpetual Spark Plug Co.
Fan Flame Spark Plug Co., 2 Hudson St., Yonkers, N. Y.
Faw, J. H., 37 Warren St., New York, N. Y. "Red Seal." (See page 387.)
Firebrand—See Express Spark Plug Co.
Firefly—See Sharp Spark Plug Co.
Fleer-Petty Co.—See Mazda Electric Co.
Fulton Co., 1910 St. Paul Ave., Milwaukee, Wis. "Eklips." (See page 139.)
Giant—See Reflex Ignition Co.
Gibraltar—See Woodworth Mfg. Corp.
Golden Giant—See Benford Mfg. Co.
Goliath—See Sharp Spark Plug Co.
Grossmann Mfg. Corp., Emil, Bush Terminal Bldg. No. 20, Brooklyn, N. Y. "Red-Head."
H. M. S. Bull Dog—See Hartford Machine Screw Co.
Hampshire Mfg. Co., Hatfield, Mass. "Wizard," "Rival."
Hartford Machine Screw Co., Hartford, Conn. "Master," "H. M. S. Bull Dog." (See page 513.)
Hel-Fi—See Motor Accessories Mfg. Co.
Hercules—See Eclipse Mfg. Co.
Herz—See Pro-Mo-Tor.
Hill Insulating & Mfg. Corp., 511-13 W. 42d St., New York, N. Y. "Answer." (See page 513.)
Ideal Mfg. Co., 14th & Harrison Sts., (North Kansas City) Kansas City, Mo. "Biltzen."
J-D—See Champion Spark Plug Co.
J. E. F. Spark Plug Co., 1826 Brown St., Milwaukee, Wis.
Janesville Products Co., 600 W. Milwaukee St., Janesville, Wis. "Eagle," "X. L."
Johnson Bros., 803 Downing St., Denver, Colo.
Kant Break—See Mazda Electric Co.
Kant Mis Spark Plug Co., S. Washington St., Green Bay, Wis. (See page 507.)
Kid—See Reflex Ignition Co.
Kingston—See Kokomo Electric Co.
Kokomo Electric Co., 1415 Webster St., Kokomo, Ind. "Kingston."
Kopper King—See Sharp Spark Plug Co.
L-A—See Lockwood-Ash Motor Co.
La French Power Spark Plug Co., 16-18 E. First Ave., Columbus, O.
Leader—See Bigsby-Rotary Mfg. Co.
Lightning—See Reflex Ignition Co.
Lincoln—See Standish Mfg. Co.
Lion—See Rex Ignition Mfg. Co.
Lockwood-Ash Motor Co., 1801 Horton St., Jackson, Mich. "L-A." "Sterling."
Long Bros., Broadway & Buckeye St., Kokomo, Ind. "Royal," "Service."
Long Distance Spark Plug Co., Chamber of Commerce Bldg., Birmingham, Ala.
MacGregor Co., Johns, Roslindale, Mass. "Viking."
Master—See Hartford Machine Screw Co.
Mazda Electric Co., Tenth & Pine Sts., St. Louis, Mo. (Sole Distributors for Fleer-Petty Co., St. Louis, Mo.) "Kant Break."
Meter—See Champion Spark Plug Co.
Milwaukee Auto Specialty Co., 705-15 Chestnut St., Milwaukee, Wis.
Mogul—See Gas Motor Efficiency Co.
Monarch—See Benford Mfg. Co.
Mosler & Co., A. R., Mt. Vernon, N. Y. "Spit Fire," "Triumph," "Vesuvius," "Superior."
Motor Accessories Mfg. Co., Marshalltown, Ia. "Hel-Fi."
National—See Bergie National Spark Plug Co.
New York Mica & Mfg. Co., Clark & Green Sts., Auburn, N. Y. "Auburn," "Wright."
Oakes & Dow Co., 15 Chardon St., Boston, Mass. "Comet," "Sootless."
Ovee Mfg. Co., 123-25 S. 12th St., Louisville, Ky.
Oxygenerator Co., 1919 Michigan Ave., Chicago, Ill. "Oxy."
Oxy—See Oxygenerator Co.
Panther—See B. A. T. Co.
Peco—See Power & Efficiency Co.
Perpetual Spark Plug Co., 330 E. Drinker St., Dunmore, Pa. "Ezekleen."
Porter & Co., W. S., 608 S. Dearborn St., Chicago, Ill. "Radium."
Power & Efficiency Co., 55 Quarry St., Trenton, N.J. "Peco."
Pro-Mo-Tor, 245 W. 55th St., New York, N. Y. "Herz." (See page 513.)
Pronto Mfg. & Sales Co., 614-16 Paxton Blk., Omaha, Neb.
Protecto—See Vital Mfg. Co.
Push-Clean—See Wellman-Howe Mfg. Co.
Quick Action Ignition Co., South Bend, Ind.
Radium—See Porter & Co.
Rajah Auto Supply Co., Bloomfield, N. J. (See page 511.)
Randall-Faichney Co., 76 Atherton St. (Jamaica Plain), Boston, Mass. "Blitz."
Red-Head—See Grossman Mfg. Corp.
Red Seal—See Faw, J. H.
Red Shield—See Wesco Supply Co.
Reflex Ignition Co., 1710 Payne Ave., Cleveland, O. "Arrow," "Lightning," "Giant," "Baby," "Kid," "Diamond." (See page 595.)
Reliance—See Champion Spark Plug Co.
Rex Ignition Mfg. Co., 250 W. 54th St., New York, N. Y. "Lion."
Rival—See Hampshire Mfg. Co.
Rosco—See Rosen & Co.
Rosen & Co., A. W., 610-14 Broadway, New York, N. Y. "Rosco."
Royal—See Long Bros.
Rummell Mfg. Works, 117 E. Sandusky St., Findlay, O.
Service—See Long Bros.
Sharp Spark Plug Co., 3343 Broadview Rd., Cleveland, O. "Firefly," "Goliath," "Kopper King."
Shaw Mfg. Co., Oak Park, Ill. "Triumph."
Silvex Co., South Bethlehem, Pa. "Bethlehem."
Sootless—See Oakes & Dow Co.
Spit Fire—See Mosler & Co.
Splitdorf Electrical Co., Newark, N. J. "Common Sense."
Sta-Rite—See Champion Spark Plug Co.
Standish Mfg. Co., Myles, 419 S. 12th St., Omaha, Neb. "Lincoln."
Star—See Champion Spark Plug Co.
Sterling—See Lockwood-Ash Motor Co.
Stewart-Warner Speedometer Corp., Chicago, Ill. "V-Ray." (See page 499.)
Stitt Ignition Co., 22 E. First Ave., Columbus, O.
Su-Dig—See Superior Motor Power Co.
Superior—See Mosler & Co.
Superior Motor Power Co., 135 Fifth Ave., New York, N. Y. "Su-Dig." "Twin-Tact."
Thomas Spark Plug Co., Roselle Park, N. J.
3-X Spark Plug Co., 2129 Michigan Ave., Chicago, Ill.
Titan—See Champion Ignition Co.
Triumph—See Mosler & Co.
Triumph—See Shaw Mfg. Co.
Tungsten Mfg. Co., Marshalltown, Ia.
Twin Fire Spark Plug Co., 720 Grand River Ave., Detroit, Mich.

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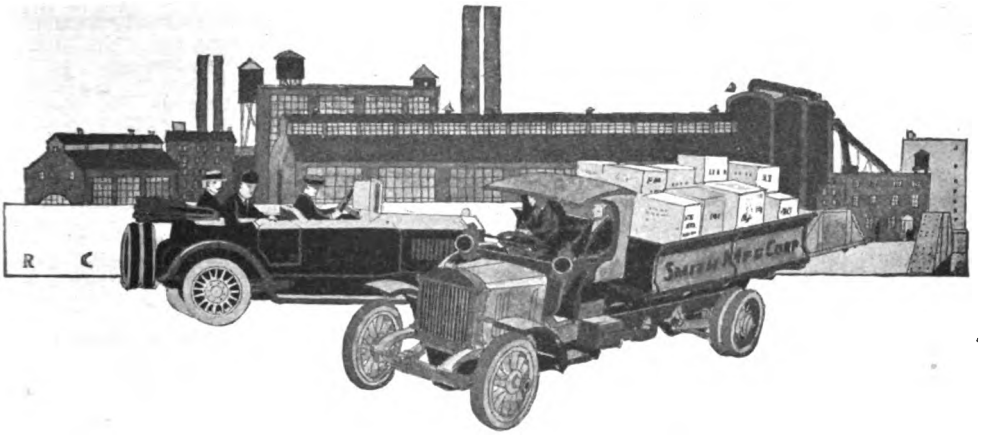

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Rajah is the spark plug demanded by aviators. It is the choice of automobile racers and hill climbers. It is found in the fastest speed boats.

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Sell a *complete set* of Rajah Plugs and give your customers the full benefit of the change.

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SPARK PLUGS

Manufactured by

Rajah Auto Supply Co., Bloomfield, N. J.

Sales Department

Edward A. Cassidy Co., Inc., 280 Madison Ave., New York

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PLUGS, Spark (Continued)

Twin-Tact—See Superior Motor Power Co.
Uko—See Utility Co.
Utility Co., 636 W. 44th St., New York, N. Y. "Uko."
V-Ray—See Stewart-Warner Speedometer Corp.
Vesuvius—See Mosler & Co.
Viking—See MacGregor Co.
Visible Spark Plug Co., McKuna Power Bldg., Pittsburgh, Pa.
Vital Mfg. Co., 7507 Quincy St., Cleveland, O. "Protecto."
Wasco—See Washington Automobile Supply Co.
Washington Automobile Supply Co., Washington, Ill. "Wasco."
Wellman-Howe Mfg. Co., 21 E. Van Buren St., Chicago, Ill. "Push-Clean."
Wesco Supply Co., Seventh St. & Clark Ave., St. Louis, Mo. "Red Shield."
Western Spark Plug Co., 14th & Harrison Sts., North Kansas City, Mo. "Wesplug."
Wesplug—See Western Spark Plug Co.
William Mfg. Co., Dodd, 7 E. 42d St., New York, N. Y.
Wizard—See Hampshire Mfg. Co.
Woodworth Mfg. Corp., Niagara Falls, N. Y. "Gibraltar." (See page 721.)
Wright—See New York Mica & Mfg. Co.
X L—See Janesville Products Co.
XXX Auto Accessory Co., Springfield, Mass.

PLUGS, Special and Priming Spark, for Fords

Ac-Cico—See Champion Ignition Co.
Answer—See Hill Insulating & Mfg. Corp.
Arrow—See Reflex Ignition Co.
Auburn Ignition Mfg. Co., Auburn, N. Y. "Long Henry." (See page 521.)
B. A. T. Co., Germantown & Stenton Aves., Philadelphia, Pa. "Panther."
Benford Mfg. Co., Box H, Mt. Vernon, N. Y. "Monarch." (See page 517.)
Benton Co., L. F., 300 Main St., Vergennes, Vt.
Bethlehem—See Silvex Co.
Champion Ignition Co., Flint, Mich. "Ac-Cico." (See page 517.)
Champion Spark Plug Co., 1016 Upton Ave., Toledo, O. (See page 509.)
Collier Mfg. Co., 3011 Lyndale Ave., S., Minneapolis, Minn. "Gold Disc."
Derf Mfg. Co., 90 W. Broadway, New York, N. Y. (See page 513.)
Diamond Z—See Hampshire Mfg. Co.
Evergood—See Grossman Mfg. Corp.
Flash—See Long Bros.
Gardner Carburetor & Brass Works, 201 Summit Ave., Detroit, Mich.
Gold Disc—See Collier Mfg. Co.
Grossman Mfg. Corp., Emil, Bush Terminal Bldg. No. 20, Brooklyn, N. Y. "Evergood."
Hampshire Mfg. Co., Hatfield, Mass. "Diamond Z."
Hartford Machine Screw Co., Hartford, Conn. "Master." (See page 513.)
Herz—See Pro-Mo-Tor.
Hill Insulating & Mfg. Corp., 511-13 W. 42d St., New York, N. Y. "Answer." (See page 513.)
Long Bros., Broadway & Buckeye St., Kokomo, Ind. "Flash."
Long Henry—See Auburn Ignition Mfg. Co.
MacGregor Co., John, Roslindale, Mass. "Viking."
Master—See Hartford Machine Screw Co.
Monarch—See Benford Mfg. Co.
Mosler & Co., A. R., Mt. Vernon, N. Y. "Ram Rod."
Oakes & Dow Co., 15 Chardon St., Boston, Mass. "Sootless."
Panther—See B. A. T. Co.
Pro-Mo-Tor, 245 W. 55th St., New York, N. Y. "Herz." (See page 513.)
Rajah Auto Supply Co., Bloomfield, N. J. (See page 511.)
Ram Rod—See Mosler & Co.
Reflex Ignition Co., 1710 Payne Ave., Cleveland, O. "Arrow." (See page 595.)
Rex Ignition Mfg. Co., 250 W. 54th St., New York, N. Y.
Sharp Spark Plug Co., 3343 Broadview Rd., Cleveland, O.
Siebert Engineering Co., 131 E. Third St., Dayton, O.
Silvex Co., South Bethlehem, Pa. "Bethlehem."
Sootless—See Oakes & Dow Co.
Stewart-Warner Speedometer Corp., Chicago, Ill. "V-Ray." (See page 499.)
V-Ray — See Sewart - Warner Speedometer Corp.
Wiring—See MacGregor Co.

PLUGS, Tire Repair

Conley, G. F., 1336 Michigan Ave., Chicago, Ill.
Continental Rubber Works, 1902 Liberty St., Erie, Pa. "Vitalic."
G. A. C.—See General Appliance Co.
General Appliance Co., 100 Boylston St., Boston, Mass. "G. A. C."
Goodrich Co., B. F., S. Main St., Akron, O.
Sampson—See Stevens & Co.
Stevens & Co., 375 Broadway, New York, N. Y. "Sampson."
Tingley & Co., Chas. O., 21 St. Georges Ave., Rahway, N. J.
Vitalic—See Continental Rubber Works.
Yatman Rubber Co., 267-69 Mt. Pleasant Ave., Newark, N. J.

PNEUMATIC CHUCKS — See Chucks, Pneumatic

PNEUMATIC TIRES—See Tires

PNEUMATIC WHEELS—See Wheels, Special

POCKET COMPASSES—See Compasses, Motorists' Pocket

POCKET LIGHTS—See Lights, Electric Flash

POCKET METERS—See Gages, Battery

POCKETS, Door, for Fords

(See also Covers, Slip; also Tops, Special)

Atlas Specialty Mfg. Co., 16-22 E. 24th St., Chicago, Ill. (See page 123.)
Chicago Hassock Co., 1731 S. State St., Chicago, Ill.
Detroit Auto Door Pocket Co., 35-37 Harrison Ave., Detroit, Mich.
Hopp Carriage Co., Mifflinburg, Pa.
Martin Mfg. Co., Forest Rose Ave., Lancaster, O.
Nathan Novelty Mfg. Co., 84-90 Reade St., New York, N. Y. (See page 153.)
Simon & Co., S. C., 404-12 Brown St., Philadelphia, Pa.

POCKETS, STAKE—See Pockets, Truck Stake

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360 Points Ignition
SPARK PLUG
INDESTRUCTIBLE CORE

This is not just another spark plug, but a distinctive plug so designed that it conforms with the present day low grade of fuel—in other words it's a 1918 plug for 1918 gasoline. Think what that means and then you'll want to handle it yourself.

Automobile Club of America, certified test No. 38, with 8-cylinder Cadillac Limousine, shows saving of 25%.

Motor Truck Club of America, certified test 5 ton truck, 5 tons of coal, total weight 20,700 lbs. shows saving of 34.4%.

This test makes 27¢ gasoline cost 18¢ per gallon.

Live dealers can find no excuse for not selling this Spark Plug.

Write at once for full details.

Derf Mfg. Co.
90 West Broadway, cor. Chambers St., Gerken Bldg., N. Y. C.

Herz Plug

The Famous "Bougie Mercedes" of Europe

Unbreakable stone-and-steel construction, with the NEW OIL-PROOF MICA-CORE INSULATION (compression-tight and practically indestructible).

The firing chamber behind the clover-leaf electrode produces the much-desired SHOOTING spark

The very perfection of scientific plug construction.

DEALERS:
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Makers of the "Minimax" Garage Pump

Built Up To a STANDARD

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No matter how large our volume may grow—we would never sacrifice the high quality of Master Calorite Spark Plugs to meet a price.

Master Plugs have proven equal to the most gruelling conditions of service and have amply proven our claim that in design, workmanship and complete dependability they mark

THE HIGHEST ACHIEVEMENT IN SPARK PLUG CONSTRUCTION.

Six Styles—A Plug for Every Engine

$1.00 and $1.25 Each

Depending upon the type
Generously guaranteed and made only by

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The Plug with Fewer Parts

The "Answer"

No Gaskets
No Bushings
One-Piece Shell
Unbreakable
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RETAIL PRICES
Ford Special.....75c
Regular Sizes.... $1.00

A Guaranteed Plug That Ensures Big Profits to the Dealer

The talking points are evident and the manufacturer guarantees satisfaction to the extent of gladly replacing any faulty Answer Plug with a new one, free of charge.

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POCKETS, Truck Stake

Eberhard Mfg. Co., 2734 Tennyson Ave., Cleveland, O.

POINTS, PLATINUM—See Platinum; also Points, Sparking

POINTS, Sparking

(Rivets, Contact Points and Screws of Platinum or Platinum Substitute; for Platinum in sheets, rods or wire—See Platinum, Sheet)

American Platinum Works, 225-31 N. J. R. R. Ave., Newark, N. J.

Baker & Co., Newark, N. J. (See page 507.)

Bishop & Co., Platinum Works, J., Malvern, Pa.

Commercial Research Co., Jackson Ave. & Honeywell St., Long Island City, N. Y. "Comreco."

Driver-Harris Wire Co., Harrison, N. J. "Ignito."

Gilfillian Bros. Smelting & Refining Co., 217 W. Sixth St., Los Angeles, Cal.

H. & L. Mfg. Co., 300 W. Broadway, New York, N. Y.

Heeren Bros. & Co., Penn Ave. & Ellesmere St., Pittsburgh, Pa.

Ignito—See Driver-Harris Wire Co.

R. & H. Platinum Works, 100 William St., New York, N. Y. (See page 507.)

Tungsten Products Co., Chester & E. 30th St., Cleveland, O.

Weidenhoff, Joseph, 1215-19 S. Ashland Ave., Chicago, Ill.. (See page 519.)

Wilson Co., H. A., 97 Chestnut St., Newark, N. J.

POLISHERS, ELECTRIC PORTABLE—See Drills, Electric Portable

POLISHES, Automobile Body

(See also Soaps, Automobile)

A B C Reviver—See Standard Varnish Works.

A-No-One Polish Co., 363 Jefferson Ave., Rochester, N. Y.

A-S-K—See Dayton Polish Co.

Acme Polish Co., 7227 Mt. Vernon St., Pittsburgh, Pa.

Adams & Elting Co., 716-26 Washington Blvd., Chicago, Ill. "Hy-Pol." (See page 199.)

Advance Oil Works, 310-12 Flushing Ave., Brooklyn, N. Y.

Alder Chemical Co., Mt. Vernon, N. Y. "Star."

Alexander Mfg. Co., J., 1931 Broadway, New York, N. Y. "Holbrook." (See page 457.)

American Textile Mfg. Co., 1637 Haydon Ave., Cleveland, O. "Golden Rod."

Americus Products Mfg. Co., 149 W. Canfield Ave., Detroit, Mich.

Arnold, N. B., 1 Sigourney St., Brooklyn, N. Y. "Silkup."

Arnstein, Eugene, 45 W. 26th St., Chicago, Ill. "Century."

Auto Gloss—See Hall-Thompson Co.

Auto-Gloss—See Indianapolis Paint & Color Co.

Auto-Lak—See Johnson & Son.

Auto-Newer—See Pimbley Paint & Glass Co.

Auto Products Mfg. Co., Buffalo, N. Y. "Rub-on." (See page 255.)

Auto-Klean—See Lucas & Co.

Auto Kleen—See Simons Mfg. Co.

Autoclean—See Bridgeport Wood Finishing Co.

B. P. S.—See Patterson-Sargent Co.

Baum's Castorine Co., 104 N. George St., Rome, N. Y.

Be-Be-Co—See Boston Blacking Co.

Ben-Hur Metal Polish Co., 108 E. Market St., Crawfordsville, Ind.

Billings-Chapin Co., Cleveland, O. "Reflectal."

Black Seal Specialty Co., 424 Caswell Blk., Milwaukee, Wis.

Blue Ribbon—See International Metal Polish Co.

Blue Ribbon Mfg. Co., 27 Baldwin St. (Charlestown), Boston, Mass. "Premium."

Bobrick Chemical Co., 111-17 S. Garey St., Los Angeles, Cal. "Three X."

Body-Nu—See Nu-Back Mfg. Co.

Boston Blacking Co. (East Cambridge), Cambridge, Mass. "Be-Be-Co."

Boston Spray Co., 28 Beach St., Boston, Mass.

Boyer Chemical Co., 18 E. Kinzie St., Chicago, Ill.

Boyle Co., A. S., 1946 Dana Ave., Cincinnati, O. "Old English."

Bradley & Vrooman Co., 2629 Dearborn St., Chicago, Ill. "Perma-Lac."

Brett Dimmer Co., A. H., Mason City, Ia. "C. C."

Bridgeport Wood Finishing Co., New Milford, Conn. "Autoclean."

Brilliant Products Co., 13 Park Row, New York, N. Y.

Brooks & Co., Clarence, 249-77 Chestnut St., Newark, N. J.

Buettner Co., Charles H., Cincinnati, O. "Unisco."

Buffalo Specialty Co., 375 Ellicott St., Buffalo, N. Y. "Liquid Veneer." (See page 517.)

Bule Chemical Corp.—See Rodriguez, R. E.

C. C.—See Brett Dimmer Co.

Callery & Co., W. W., 188 36th St., Pittsburgh, Pa.

Camden Chemical Mfg. Co., 18th & Mickle Sts., Camden, N. J. "Greyhound."

Century—See Arnstein, Eugene.

Channell Chemical Co., 1410 Carroll Ave., Chicago, Ill. "O-Cedar."

Chemical Spray Co., 74 Pearl St., Boston, Mass.

Chicago White Lead & Oil Co., 1454 S. Western Ave., Chicago, Ill.

Cincinnati Oil Works Co., 525 Eggleston Ave., Cincinnati, O. "Re-Nu."

Cleanit—See Perkins-Campbell Co.

Cleanola Co., Fulton Bldg., Pittsburgh, Pa.

Cleen Shyne—See Sole Mfg. Co.

Columbus Varnish Co., Columbus, O. "Peerless." (See page 253.)

Common-Sense Mfg. Co., 506 N. Whittier St. Louis, Mo. (See page 605.)

Cook, Geo. E., 2322 Broadway, New York, N. Y.

Cortland Specialty Co., 174-78 Railroad St., Cortland, N. Y. "Houts."

Crew-Levick Co., 111 N. Broad St., Philadelphia, Pa. "Mistokleen," "Mistokloth."

Crum Mfg. Co., 120 N. Main St., Ottawa, Kans "Spray-Pol."

Crystal Clear-O.—See Rodriguez, R. E.

Dayton Polish Co., Bacon St., Dayton, O. "A-S-K."

Detroit White Lead Works, 530-60 Milwaukee Ave., E. Detroit, Mich. "Rogers."

Diamond Holdfast Patch Co., 10 Auburn Ave., Atlanta, Ga.

Diamond Polish Co., Brown Bldg., Washington, Pa.

Du Mor Specialty Co., 1353 Walnut St., Cincinnati, O.

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No Grease, No Oil, No Gum, No Wax

Lyknu does not aim to improve upon the original, beautiful baked-on surface given to a car by its manufacturer—a surface that cannot be improved upon.

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Lyknu cuts down by at least three-quarters the usual hard work of polishing an automobile.

Only one cloth is needed—*not two!*

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Lyknu quality—not physical energy—does the work.

You simply *moisten* a piece of cheesecloth with a few drops of Lyknu by applying cloth to mouth of bottle. Then, with this single cloth, you go over the car, rubbing only until surface is dry. No second cloth—no second operation!

Write on your business letterhead for bottle of Lyknu sent prepaid with our compliments.

Lyknu Polish Mfg. Co.
PITTSBURGH, PA.

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POLISHES, Automobile Body (Continued)

Dulin Mfg. Co., J. E., 460 S. Grant St., Springfield, Mo. "Dumaco."

Dumaco—See Dulin Mfg. Co.

Durkee-Atwood Co., Minneapolis, Minn. "Rie-Nie," "Re-Nu."

E-Z-Kleen—See Rexine Co.

Eberson-Lindsley Paint Co., 1830-32 Morgan St., St. Louis, Mo.

Eclat Mfg. Co., 3425 S. State St., Chicago, Ill.

Eclipse—See Willey Co.

Enâmo Mfg. Co., 239 Clementina St., San Francisco, Cal.

Ensign Refining Co., 10605 Quebec Ave., Cleveland, O. "Polishem."

Ever-Shine—See Ferro Chemical Co.

Ezy Brite—See Rodriguez, R. E.

Fairchild & Bro., M. H., 6 W. Austin Ave., Chicago, Ill. "Royal Mist."

Faultless—See Hawkeye Oil Co.

Ferro Chemical Co., 5656 Broadway, Chicago, Ill. "Ever-Shine."

Finaline Mfg. Co., 4915 Maple Ave., St. Louis, Mo.

Flint Varnish & Color Works, Flint, Mich.

Frazer Lubricator Co., 3921 Normal Ave., Chicago, Ill.

Frey Mfg. Co., 1508 Michigan Blvd., Chicago, Ill. "Protexacar."

Gee-Bee—See Green Bay Supply Co.

Glover, E. O., 142 Nectarine St., Philadelphia, Pa.

Gold Medal—See Hoffman Co.

Golden Rod—See American Textile Mfg. Co.

Golden Star—See Morris Mfg. Co.

Green, Walter E., 2050 W. Monroe St., Chicago, Ill.

Green Bay Supply Co., 518 Maine St., Green Bay, Wis. "Gee-Bee." (See page 207.)

Greyhound—See Camden Chemical Mfg. Co.

Hall-Thompson Co., Hartford, Conn. "Wonder Worker," "Auto Gloss." (See page 739.)

Hallett & Co., H. M., Ludington, Mich. "New Life."

Harvey Chemical Co., Wickliffe, O. "Lin-Lac."

Hawkeye Oil Co., Miles & Roosevelt Sts., Waterloo, Ia. "Faultless."

Heaney Mfg. Co., 164 State St., Boston, Mass.

Hoffman Co., Geo. Wm., 6 Cliff St., New York, N. Y. "Gold Medal."

Holbrook—See Alexander Mfg. Co.

Hollingshead Co., R. M., 112 N. Ninth St., Camden, N. J. "Nugloss."

Houts—See Cortland Specialty Co.

Hy-Pol—See Adams & Elting Co.

I. C. U.—See Livingston Co.

Imperial Oil Co., 1915 Locust St., St. Louis, Mo. "Marvin." (See page 197.)

Indianapolis Paint & Color Co., 118 W. Chesapeake St., Indianapolis, Ind. "Auto-Gloss."

Ingham's—See Perfection Polish Co.

Instant Products Co., 15 W. Swan St., Buffalo, N. Y. "Life-O-Wood."

International Metal Polish Co., Quill St. & Belt R. R., Indianapolis, Ind. "Blue Ribbon."

Jaffa Co., 2400 Superior Viaduct, Cleveland, O.

Jewel—See Wadsworth-Howland Co.

Johnson & Son, S. C., 1012 16th St., Racine, Wis. "Auto-Lak."

Keepnew Varnishol—See Par-Kop Mfg. Co.

Kleano—See Tay-Miller Mfg. Co.

Lac-Mar Co., 1228 Tuscarawas St., E., Canton, O.

Larkins Chemical Co., 108 W. Fourth St., Pasadena, Cal. "Oil of Delight."

Le Doyen, Frank J., 827 Mangold St., Baltimore, Md. "Var-Noil."

Lee Mfg. & Chemical Co., Wm. E., 622 Cypress Ave., Kansas City, Mo. "Varnishine."

Life-O-Wood—See Instant Products Co.

Liquid Veneer—See Buffalo Specialty Co.

Livingston Co., 161 Day St., New Haven, Conn. "I. C. U."

Lin Lac—See Harvey Chemical Co.

Lord Polish Co., F. T., 37 Hovey Ave., Cambridge, Mass. "Sun-Glo."

Lucas & Co., John, 322-30 Race St., Philadelphia, Pa. "Auto-Klean."

Lusterall Co., Hollingsworth Bldg., Los Angeles, Cal.

Luster-O'all Co., 503 N. Fifth St., Quincy, Ill.

Lustre Mfg. Co., 16 W. Kinzie St., Chicago, Ill.

Lyknu Polish Mfg. Co., 916 Forbes St., Pittsburgh, Pa. (See page 515.)

Lyon & Healy, 52-58 Jackson Blvd., Chicago, Ill. "Zol."

Majestic—See Suydam Co.

Many-Use Oil Co., 113 Chambers St., New York, N. Y.

Marathon—See Weinberg & Co.

Martin-Senour Co., 2510 Quarry St., Chicago, Ill.

Marvin—See Imperial Oil Co.

Matchless—See Standard Oil Co. of N. Y.

Mat's—See Weiss Polish Works.

Meadowcroft Chemical Co., Saybrook, Conn. "Rite Brite."

Milmore Corp., Citizens Nat'l Bank Bldg., South Bend, Ind.

Mirrorlike Mfg. Co., 203 Eighth St., Long Island City, N. Y.

Mistokleen—See Crew-Levick Co.

Mistokloth—See Crew-Levick Co.

Monarch—See Suydam Co.

Monogram—See New York Lubricating Oil Co.

Moore Oil Co., York St. & McLean Ave., Cincinnati, O.

Morgan Mfg. Co., Keene, N. H. "Nuglos."

Morris Mfg. Co., R. W., 821 E. 21st St., Kansas City, Mo. "Golden Star."

National Mfg. Co., 227 Portage St., Kalamazoo, Mich.

New Life—See Hallett & Co.

New Method Varnish Co., Realty Bldg., Elmira, N. Y. "Uncle Hiram's."

New York Lubricating Oil Co., 116 Broad St., New York, N. Y. "Monogram."

Noble Piano Co., 971 Woodward Ave., Detroit, Mich.

Norwesco—See Northwestern Chemical Co.

Northwestern Chemical Co., 610 State St., Marietta, O. "Norwesco." (See page 205.)

Noxal Polish Mfg. Co., 1238 Belmont Ave., Philadelphia, Pa.

Nu-Back Mfg. Co., 114 N. Commercial St., St. Louis, Mo. "Body-Nu."

Nubian Paint & Varnish Co., 1856 Le Claire Ave., Chicago, Ill. "Re-Vi-Var."

Nuglos—See Morgan Mfg. Co.

Nugloss—See Hollingshead Co.

O-Cedar—See Channel Chemical Co.

Oil of Delight—See Larkins Chemical Co.

Oilzum—See White & Bagley Co.

Old English—See Boyle Co.

Optimus Mfg. Co., 193 Hanover St., Boston, Mass.

Osmaco—See Schlegel Mfg. Co.

Par-Kop Mfg. Co., 1522-24 Ingersoll St., Philadelphia, Pa. "Keepnew Varnishol."

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Then there are others, whose big aim is to make as much money as they can on each sale, regardless of value given or anything else.

You, Mr. Manufacturer, must belong to one of these two classes—there is no go-between.

Is it the latter? If so, then we cannot do business with you. But if you are trying to build a car that will make your name echo through the ages, we respectfully submit for your 1914 consideration

BENFORD'S Monarch Spark Plug

It will add the last touch of perfection to your motor, and will make it run like a top.

Don't take our word for this! Make us show you.

We will gladly submit samples to test. A post card will fetch them.

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50c. Brass Finished L-V Sprayer and $1.00 package of LIQUID VENEER (enough for 20 average cleanings)

Retails at $1.50
Packed complete in Carton

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Concentrate on the AC line. Be prepared to meet the tremendous and ever-mounting demand for these dependable spark plugs. Profit by an alliance with the world's most successful spark plug manufacturer.

More manufacturers factory-equip their cars with AC Plugs than all other makes combined. For years, thousands of motorists have bought and used AC Plugs exclusively. A big national advertising campaign is stimulating AC sales for *you*. Write today for complete dealer information.

Champion Ignition Company
FLINT, *Michigan*

U. S. Pat. No. 1,135,727, April 13, 1915. U. S. Pat. No. 1,216,139, Feb. 13, 1917. Other patents pending.

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SPARK PLUG

is cleaned by each explosion

$1.50

It should be an easy matter for you to sell a set of these SELF-CLEANING plugs to every car owner in your town, because they eliminate 90% of all spark plug troubles—fouling and carbon formation.

The reason carbon cannot form in this plug is owing to the patent plunger which operates with each explosion of the motor. A demonstration sells them.

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POLISHES, Automobile Body (Continued)

Patterson-Sargent Co., E. 38th & St. Clair Sts., Cleveland, O. "B. P. S."
Peerless—See Columbus Varnish Co.
Perfection Polish Co., Waverly, N. Y. "Ingham's."
Perkins-Campbell Co., 634 Broadway, Cincinnati, O. "Cleanit." (See page 227.)
Perma-Lac—See Bradley & Vrooman Co.
Pimbley Paint & Glass Co., St. Joseph, Mo. "Auto-Newer."
Pioneer Mfg. Co., Harvard Ave. & E. 103d St., Cleveland, O. "Shino."
Polac Co., Boston, Mass.
Polishem—See Ensign Refining Co.
Poughkeepsie Utilities Corp., Poughkeepsie, N. Y. "Utility."
Premier—See United Chemical Co.
Premium—See Blue Ribbon Mfg. Co.
Protexacar—See Frey Mfg. Co.
Pure Oil Co., First St. & 13th Ave., S., Minneapolis, Minn. "Puritan."
Puritan—See Pure Oil Co.
Puritan Soap Co., 500 Exchange St., Rochester, N. Y.
Rapid—See Shannon, T. R.
Rath Mfg. Co., Hedley & Richmond Sts (Frankford), Philadelphia, Pa.
Refine Co., Sheboygan, Mich.
Reid Mfg. Co., W. W., 204 Milk St., Boston, Mass. "Waxol."
Re-Nu—See Cincinnati Oil Works Co.
Re-vi-Var—See Nubian Paint & Varnish Co.
Reflectal—See Billings-Chapin Co.
Rentz Co., C. J., Greenwood Bldg., Cincinnati, O.
Rexine Co., Pennsylvania & River Sts., Sheboygan, Wis. "E-Z-Kleen."
Rie-Nie Re-Nu—See Durkee-Atwood Co.
Rite-Brite—See Meadowcroft Chemical Co.
Rite-Way Polish Co., 56 State St., Detroit, Mich.
Roberts Co., C. F., 278 Brush St., Detroit, Mich. "Splendola."
Robertson Machine & Foundry Co., 53 Rano St., Buffalo, N. Y. "Sta-Bright."
Rodriguez, R. E., 56-58 Warren St., New York, N. Y. "Ezy Brite." (Also Sole Distributors for Bule Chemical Corp., New York, N. Y. "Crystal Clear-O.")
Rogers—See Detroit White Lead Works.
Roglo—See Ross Gloss Co.
Ross Gloss Co., Auburndale, Mass. "Roglo."
Royal Mist—See Fairchild & Bro.
Rub-On—See Auto Products Mfg. Co.
S. & B.—See Uno Mfg. Co.
Sani-Mist Co., New London, Conn.
Sanozone Chemical Co., 5 N. 20th St., Philadelphia, Pa.
Satin Spray Co., 113 Lakeview Ave., Cambridge, Mass.
Schlegel Mfg. Co., Oscar, 111 E. 12th St., New York, N. Y. "Osmaco."
Shannon, T. R., 19 Lorraine St., Hartford, Conn. "Rapid."
Shino—See Pioneer Mfg. Co.
Shinauto Mfg. Co., 1422 N. Illinois St., Indianapolis, Ind.
Shine-Brite Products Co., 2249 N. Delaware St., Indianapolis, Ind.
Simons Mfg. Co., 2121 Michigan Ave., Chicago, Ill. "Auto Kleen."
Silkup—See Arnold, N. B.
Smith, Harrison A., Pope Bldg., Washington, D. C.
Sole Mfg. Co., 148 Chambers St., New York, N. Y. "Cleen Shyne."
Sparkler Mfg. Co., 108 Main St., Fairmount, Ind.
Splendola—See Roberts Co.
Spray-Pol—See Crum Mfg. Co.
Sta-Bright—See Robertson Machine & Foundry Co.
Standard Oil Co. of N. Y., 26 Broadway, New York, N. Y. "Matchless."
Standard Varnish Works, 90 West St., New York, N. Y. "A B C Reviver."
Star—See Alder Chemical Co.
Straight Line Mfg. Co., 27 Thames St., New York, N. Y. "Superlustre."
Sun-Glo—See Lord Polish Co.
Superlustre—See Straight Line Mfg. Co.
Sutherland & Co., P., 232 Milk St., Boston, Mass.
Suydam Co., M. B., 61st & Butler Sts., Pittsburgh, Pa. "Monarch," "Majestic."
T-M Gloss—See Tay-Miller Mfg. Co.
Tay-Miller Mfg. Co., 20th & Market Sts., Philadelphia, Pa. "T-M Gloss," "Kleano."
Three-In-One Oil Co., 165 Broadway, New York, N. Y.
Three X—See Bobrick Chemical Co.
Thumb, E. W., 872 Orleans St., Chicago, Ill.
Thurston Co., F. W., 1832-34 S. Clark St., Chicago, Ill. "Unxid."
Tobey Furniture Co., Wabash Ave. & Washington St., Chicago, Ill.
U-Sav-Your Mfg. Co., 51 Perkins St., Warren, Mass.
Ulrich & Co., 363-65 E. North St., Buffalo, N. Y. "A-O-K."
Uncle Hiram's—See New Method Varnish Co.
Unisco—See Buettner Co.
United Chemical Co., Boston, Mass. "Premier."
Universal Auto Specialty Co., 1080 Gilbert Ave., Cincinnati, O.
Uno Mfg. Co., Royal Ins. Bldg., Chicago, Ill. "S. & B."
Unxid—See Thurston Co.
Utility—See Poughkeepsie Utilities Corp.
Van Cleef Bros., 7709-11 Woodlawn Ave., Chicago, Ill.
Vaporine Co., 101 S. Wells St., Chicago, Ill.
Var-Noil—See Le Doyen, Frank J.
Varni-Shine Co., Columbus, O.
Varnishine—See Lee Mfg. & Chemical Co.
Victrolene Co., 39 Pearl St., Boston, Mass.
Vulcanite Products Co., 1630 Vine St., Philadelphia, Pa.
Wadsworth-Howland Co., 225 N. Carpenter St., Chicago, Ill. "Jewel."
Waxit Mfg. Co., Old Colony Bldg., Chicago, Ill.
Waxol—See Reid Mfg. Co.
Weinberg & Co., J. H., 128 Maiden Lane, New York, N. Y. "Marathon."
Weiss Polish Works, 216 S. Winchester Ave., Chicago, Ill. "Mat's."
Westfield Chemical Co., Main St., Westfield, Mass. "Zit."
White & Bagley Co., Worcester, Mass. "Oilzum." (See page 479.)
Willey Co., C. A., 14th & Hancock Sts., Long Island City, N. Y. "Eclipse."
Wonder-Mist Co., Melrose Sta., Boston, Mass.
Wonder Worker—See Hall-Thompson Co.
Xint Mfg. Co., 209 Woodward St., Cincinnati, O.
Zinsser & Co., W., 195 William St., New York, N. Y.
Zit—See Westfield Chemical Co.
Zol—See Lyon & Healy.

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POLISHES, BODY—See Polishes, Automobile Body

POLISHES, BRASS—See Polishes, Metal

POLISHES, Metal

A-1—See Rath Co.

A-O-K—See Ulrich & Co.

A-S-K—See Dayton Polish Co.

A-No-One Polish Co., 363 Jefferson Ave., Rochester, N. Y.

Acme Polish Co., 7227 Mt. Vernon St., Pittsburgh, Pa. "Ayrolite."

Adams & Elting Co., 716-26 Washington Blvd., Chicago, Ill. "Shinite." (See page 199.)

Advance Oil Works, 310-12 Flushing Ave., Brooklyn, N. Y.

Ajax—See Crowell Chemical Co.

Amalie—See Sonneborn Sons.

American—See Harvey Chemical Co.

American Metal Polish Co., 89 Winslow Ave., W., West Somerville, Mass. "North Star," "Meyers."

American Soap & Washoline Co., 140-80 Central Ave., Cohoes, N. Y. "I. C. N."

Americus Products Mfg. Co., 149 W. Canfield Ave., Detroit, Mich.

Anchor—See Hoffman Paint & Varnish Co.

Anchor—See New England Oil, Paint & Varnish Co.

Apex Polishine—See Millers Sons Co.

Arco Co., Euclid Ave. & E. 65th St., Cleveland, O.

Armiger Chemical Co., 2155-57 Austin Ave., Chicago, Ill. "Rex."

Army & Navy—See Grady Mfg. Co.

Arnold, N. B., 1 Sigourney St., Brooklyn, N. Y. "Slikup."

Arnstein, Eugene, 45 W. 26th St., Chicago, Ill. "Shine-All."

Ayrolite—See Acme Polish Co.

Baum's Castorine Co., 104 N. George St., Rome, N. Y.

Beacon—See Cincinnati Oil Works Co.

Bell—See Reid Mfg. Co.

Ben Hur Metal Polish Co., 108 E. Market St., Crawfordsville, Ind.

Bertrams—See New Jersey Paint Works.

Blair Co., J. T., 617 Commerce St., Nashville, Tenn. "J. T."

Blue Ribbon—See International Metal Polish Co.

Blue Ribbon Mfg. Co., 27 Baldwin St., (Charlestown), Boston, Mass. "Peerless," "Kantburn," "Premium."

Bobrick Chemical Co., 111-17 S. Garey St., Los Angeles, Cal. "Radium," "E. Z. Q."

Boyer Chemical Co., 18 E. Kinzie St., Chicago, Ill.

Brass-Nu—See Nu-Back Mfg. Co.

Brett Dimmer Co., A. H., Mason City, Ia. "C. C."

Bridgeport Wood Finishing Co., New Milford, Conn. "Metalshine."

Briteline—See Harlem Supply Co.

Brite-Lite—See Pure Oil Co.

Buffalo—See Ulrich & Co.

Bully—See Weinberg & Co.

Burnishine—See Paul & Co.

C. C.—See Brett Dimmer Co.

Callery & Co., W. W., 188 36th St., Pittsburgh, Pa. "Winterton."

Campbell Glass & Paint Co., St. Louis, Mo. "Star."

Car-Brite—See Lord Polish Co.

Chemical Supply Co., E. 93d St., S. E. & Erie R. R., Cleveland, O.

Chicago White Lead & Oil Co., 1454 S. Western Ave., Chicago, Ill.

Cincinnati Oil Works Co., 525 Eggleston Ave., Cincinnati, O. "Beacon."

Cleaner Mfg. Co., 2842 Olive St., St. Louis, Mo. "Polishine."

Cleanola Co., Fulton Bldg., Pittsburgh, Pa. "Spe-De-Shyne."

Colgan Mfg. & Supply Co., 118 Maiden Lane, New York, N. Y. "Peerless," "Crescent."

Columbia—See Stevens, Frederic B.

Corliss Supply Co., 1906 Olive St., St. Louis, Mo.

Crescent—See Colgan Mfg. & Supply Co.

Crowell Chemical Co., 9 Oxford Terrace, Beverly, Mass. "Oxford," "Ajax."

Curry Bros. Oil Co., 253-55 Franklin St., Boston, Mass. "Superba."

Dayton Polish Co., Bacon St., Dayton, O. "A-S-K."

Detroit White Lead Works, 530-60 Milwaukee Ave., E., Detroit, Mich. "Rogers."

Diamond Polish Co., Brown Bldg., Washington, Pa.

Dielectric Mfg. Co., 224 S. Vandeventer Ave., St. Louis, Mo.

Dragon—See Paul & Co.

Durkee-Atwood Co., Minneapolis, Minn. "Rie-Nie."

E. Z. Q.—See Bobrick Chemical Co.

E-Fec-Tiv—See Permatite Mfg. Co.

Eagle Oil & Supply Co., 45 India St., Boston, Mass. "Eagleine."

Eagleine—See Eagle Oil & Supply Co.

Eavenson & Sons, J., Delaware & Penn Sts., Camden, N. J. "Jesco."

Ericka Mfg. Co., 882 Liberty St., Springfield Mass. "Shineaul."

Essex Paint Works, Essex, Conn.

Evans & Bro., 3514 Juniata St., St. Louis, Mo.

Faultless—See Hawkeye Oil Co.

Fiebing Chemical Co., 238-40 Reed St., Milwaukee, Wis. "Lusterine."

Fireball Gas Tank & Illuminating Co., 5010 Delmar Blvd., St. Louis, Mo.

Flash Chemical Co., 160-70 Second St., Cambridge, Mass.

Frazer Lubricator Co., 3921 Normal Ave., Chicago, Ill.

Garratt-Callahan Co., 37 S. Clinton St., Chicago, Ill.

German—See Sutherland & Co.

Glittershine—See Grady Mfg. Co.

Globe—See Raimes & Co.

Gold Medal—See Hoffman Co.

Golden Glitter—See Grady Mfg. Co.

Golden Sceptre—See Rath Mfg. Co.

Golden Star—See Morris Mfg. Co.

Goldshine—See Van Tillburg Oil Co.

Grady Mfg. Co., 250-56 Ely Ave., Long Island City, N. Y. "Glittershine," "Scouree," "Army & Navy," "Golden Glitter," "Summershine."

Great Western Oil Co., 2855 E. 37th St., Cleveland, O.

Hall-Thompson Co., Hartford, Conn. "Wonder Worker," "Nick-E-Lo." (See page 739.)

Harlem Supply Co., Knickerbocker Bldg., Baltimore, Md. "Briteline."

Harris Oil Co., A. W., 326 S. Water St., Providence, R. I. "Scouree."

Harvey Chemical Co., 216 N. Fifth St., Lafayette, Ind. "American."

Hawkeye Oil Co., Miles & Roosevelt Sts., Waterloo, Ia. "Faultless."

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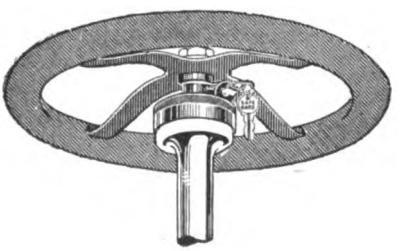

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POLISHES, Metal (Continued)

Hazen-Brown Co., 430 Court St., Brockton, Mass.

Heaney Mfg. Co., 164 State St., Boston, Mass.

Highshine—See Rath Mfg. Co.

Hinds & Coon, 124-26 Pearl St., Boston, Mass. "Ruby-Rub."

Hoffman Co., Geo. Wm., 6 Cliff St., New York, N. Y. "Gold Medal," "U. S."

Hoffman Paint & Varnish Co., 8 Medford St., Boston, Mass. "Anchor."

Hollingshead Co., R. M., 112 N. Ninth St., Camden, N. J. "Whiz."

I. C. N.—See American Soap & Washoline Co.

I. C. U.—See Livingston Co.

Imperial—See Rath Mfg. Co.

Imperial Oil Co., 1915 Locust St., St. Louis, Mo. "Marvin." (See page 197.)

Indianapolis Paint & Color Co., 118 W. Chesapeake St., Indianapolis, Ind. "Metal-Brite."

International Metal Polish Co., Quill St. & Belt R. R., Indianapolis, Ind. "Blue Ribbon."

J. T.—See Blair Co.

Jesco—See Eavenson & Sons.

Jewel—See Wadsworth-Howland Co.

Jiffy—See Staedler, Chas.

Johnston Paint Co., R. F., Pearl & Main Sts., Cincinnati, O.

Kantburn—See Blue Ribbon Mfg. Co.

Kettler Brass Mfg. Co., 109 Fairview St., Houston, Tex. "Qck Work."

Kimo Mfg. Co., 2625 Main St., Buffalo, N. Y.

Lee Mfg. & Chemical Co., Wm. E., 622 Cypress Ave., Kansas City, Mo.

Livingston Co., 161 Day St., New Haven, Conn. "I. C. U."

Lord Polish Co., F. T., 37 Hovey Ave., Cambridge, Mass. "Lumino," "Car-Brite."

Lumino—See Lord Polish Co.

Lusterine—See Fiebing Chemical Co.

McLean-Jones Oil & Supply Co., 40 Indian Wharf, Boston, Mass. "Nox-All."

Marathon—See Weinberg & Co.

Martin-Senour Co., 2510 Quarry St., Chicago, Ill.

Marvin—See Imperial Oil Co.

Matchless Metal Polish Co., 149 Varick St., New York, N. Y. "Mexoline," "Tripoline."

Maxine—See Rexine Co.

Metal-Brite—See Indianapolis Paint & Color Co.

Metalshine—See Bridgeport Wood Finishing Co.

Mexoline—See Matchless Metal Polish Co.

Meyers—See American Metal Polish Co.

Miller Co., Frank, 349-51 W. 26th St., New York, N. Y.

Millers Sons Co., A. D., Columbus & Preble Aves., Pittsburgh, Pa. "Apex Polishine."

Milmore Corp., Citizens' Nat'l Bank Bldg., South Bend, Ind.

Mobo—See Stanley, John T.

Monarch—See Suydam Co.

Moonshine—See Winn, Wm. R.

Moore Oil Co., York St. & McLean Ave., Cincinnati, O. "Mooreshine."

Mooreshine—See Moore Oil Co.

Morgan Mfg. Co., Keene, N. H. "Morganbrite."

Morganbrite—See Morgan Mfg. Co.

Morris Mfg. Co., R. W., 821 E. 21st St., Kansas City, Mo. "Golden Star."

National Cement & Rubber Co., 300-16 S. St. Clair St., Toledo, O.

National Mfg. Co., 227 Portage St., Kalamazoo, Mich.

National Oil & Supply Co., 180 Frelinghuysen Ave., Newark, N. J. "Viscos."

National Valgrinok Co., 195 Church St., Newton, Mass. "Valgrinok."

New England Oil, Paint & Varnish Co., Everett, Mass. "Anchor."

New Jersey Paint Works, Tremont & Wayne Sts., Jersey City, N. J. "Bertrams."

New-Tone Mfg. Co., 3336 Colorado Ave., Chicago, Ill. "Rayo."

Nick-E-Lo—See Hall-Thompson Co.

Noble Refining Co., 706 Canal Rd., Cleveland, O.

North Star—See American Metal Polish Co.

Northwestern Chemical Co., 610 State St., Marietta, O. "Norwesco." (See page 205.)

Norwesco—See Northwestern Chemical Co.

Nox-All—See McLean-Jones Oil & Supply Co.

Noxal Polish Mfg. Co., 1233 Belmont Ave., Philadelphia, Pa.

Nu-Back Mfg. Co., 114 N. Commercial St., St. Louis, Mo. "Brass-Nu."

O. H. M.—See Robertson Products Co.

Osmaco—See Schlegel Mfg. Co.

Oxford—See Crowell Chemical Co.

Parker Refining Co., 1307 W. 11th St., Cleveland, O.

Patterson Lubricating Co., 114 Broad St., Boston, Mass.

Paul & Co., J. C., Chicago, Ill. "Burnishine." "Dragon."

Peerless—See Blue Ribbon Mfg. Co.

Peerless—See Colgan Mfg. & Supply Co.

Penn Petroleum & Supply Co., 115-17 N. Second St., Philadelphia, Pa. "Primus."

Perfection—See Warren Refining & Chemical Co.

Permatite Mfg. Co., 67 Fifth Ave., N. E., Minneapolis, Minn. "E-Fec-Tiv."

Pioneer—See Northwestern Chemical Co.

Pioneer Mfg. Co., Harvard Ave. & E. 103d St., Cleveland, O. "Shino."

Poleshine—See Cleaner Mfg. Co.

Premier—See United Chemical Co.

Premium—See Blue Ribbon Mfg. Co.

Primus—See Penn Petroleum & Supply Co.

Pure Oil Co., First St. & 13th Ave., S., Minneapolis, Minn. "Brite-Lite."

Puritan Soap Co., 500 Exchange St., Rochester, N. Y.

Qck Work—See Kettler Brass Mfg. Co.

Radium—See Bobrick Chemical Co.

Raimes & Co., 50 Ferry St., New York, N. Y "Globe."

Rath Co., Chas. H., 53d & Broomall Sts., Philadelphia, Pa. "A-1."

Rath Mfg. Co., Hedley & Richmond Sts., (Frankford), Philadelphia, Pa. "Imperial." "Golden Sceptre," "Staraline," "Highshine." "Swiss."

Raydo—See Ulrich & Co.

Rayo—See New-Tone Mfg. Co.

Red Cross—See Robertson & Co.

Reid Mfg. Co., W. W., 204 Milk St., Boston, Mass. "Bell," "Zip."

Rex—See Armiger Chemical Co.

Rexine Co., Pennsylvania & River Sts., Sheboygan, Wis. "Maxine."

Rie-Nie—See Durkee-Atwood Co.

Robertson & Co., 1141 W. Madison St., Chicago, Ill. "Red Cross."

Robertson Products Co., O. B., 700-04 W. Division St., Chicago, Ill. "O. H. M."

Rogers—See Detroit White Lead Works.

Ruby-Rub—See Hinds & Coon.

Schlegel Mfg. Co., Oscar, 111 E. 12th St., New York, N. Y. "Osmaco."

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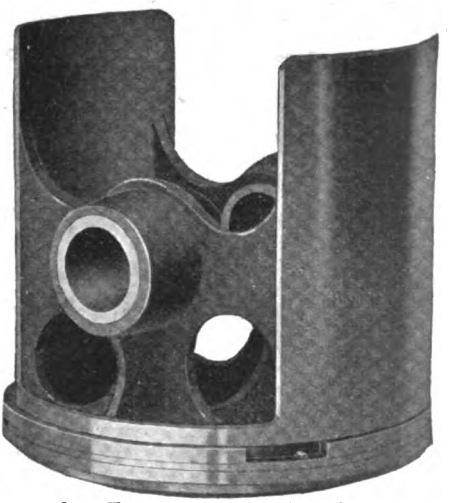

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Sparks Carbon Choked Plugs.
Causes Perfect Combustion.
Gives More Powerful Spark.
Eliminates Carbon & Vibration.

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POLISHES, Metal (Continued)

Scouree—See Grady Mfg. Co.
Scouree—See Harris Oil Co.
Shinal—See Adams & Elting Co.
Shine-All—See Arnstein, Geo. W.
Shine-Brite Products Co., 2249 N. Delaware St., Indianapolis, Ind.
Shineaul—See Ericka Mfg. Co.
Shinite—See Adams & Elting Co.
Shino—See Pioneer Mfg. Co.
Slikup—See Arnold, N. B.
Solarine Co., 153-55 N. Carpenter St., Chicago, Ill.
Solshine Mfg. Co., 204 Milk St., Boston, Mass.
Sonneborn Sons, L., 262 Pearl St., New York, N. Y. "Amalie." (See page 277.)
Spe-De-Shyne—See Cleanola Co.
Spear's Sons Co., Alden, 140 Sixth St., Boston, Mass.
Staedler, Chas., 190 Claremont Ave., Verona, N. J. "Jiffy."
Stanley, John T., 630 W. 30th St., New York, N. Y. "Mobo."
Star—See Campbell Glass & Paint Co.
Staraline—See Rath Mfg. Co.
Stay-Bright Lacquer Co., 58 W. Washington St., Chicago, Ill.
Stevens, Frederic B., Detroit, Mich. "Columbia." (See page 776.)
Summershine—See Grady Mfg. Co.
Superba—See Curry Bros. Oil Co.
Sutherland & Co., P., 232 Milk St., Boston, Mass. "German."
Suydam Co., M. B., 61st & Butler Sts., Pittsburgh, Pa. "Monarch."
Sweet, Charles F., 247 State St., Hartford, Conn.
Swiss—See Rath Mfg. Co.
Trafton Co., F. M., 176 Federal St., Boston, Mass.
Tripoline—See Matchless Metal Polish Co.
Ulrich & Co., 363-65 E. North St., Buffalo, N. Y. "A-O-K," "Buffalo," "Raydo."
Uko—See Utility Co.
U. S.—See Hoffman Co.
United Chemical Co., Boston, Mass. "Premier."
Uno Mfg. Co., Royal Ins. Bldg., Chicago, Ill.
Utility Co., 636 W. 44th St., New York, N. Y. "Uko."
Valgrinok—See National Valgrinok Co.
Van Tilburg Oil Co., 2424-28 University Ave., S. E., Minneapolis, Minn. "Wang."
Viscos—See National Oil & Supply Co.
Wadsworth-Howland Co., 225 N. Carpenter St., Chicago, Ill. "Jewel."
Wang—See Van Tilburg Oil Co.
Warren Refining & Chemical Co., Cleveland, O. "Perfection.
Weinberg & Co., J. H., 128 Maiden Lane, New York, N. Y. "Bully," "Marathon."
Whiz—See Hollingshead Co.
Winn, Wm. R., 143 Maiden Lane, New York, N. Y. "Moonshine."
Winterton—See Callery & Co.
Wonder Worker—See Hall Thompson Co.
Woodison Co., E. J., 53 Buhl Blk., Detroit, Mich.
Yale—See Rostand Mfg. Co.
Zip—See Reid Mfg. Co.

POLISHES, NICKEL—See Polishes, Metal

POLISHES, SILVER—See Polishes, Metal

POLISHING CLOTHS—See Wipers

POLISHING COMPOUNDS—See Compounds, Buffing and Polishing

PONTOONS, Seaplane

Palmer-Singer Corp., Saranac Lake, N. Y.
Reliance Motor Boat Co., 207th St. & Harlem River, W., New York, N. Y.
Rogers Construction Co., Gloucester City, N. J.
Walden-Butler Co., 281-89 Butler St., Brooklyn, N. Y.

POPPET VALVES—See Valves, Gas Engine

PORCELAIN

Artistic Porcelain Co., Trenton, N. J.
Empire China Works, 142-56 Green St., Brooklyn, N. Y.
Frenchtown Porcelain Co., Trenton, N. J. (See page 525.)
General Porcelain Co., East Liverpool, O.
Hartford Faience Co., Hartford, Conn.
Imperial Porcelain Works, Mulberry St. & New York Ave., Trenton, N. J.
J. D.—See Jeffery-Dewitt Co.
Jeffery-Dewitt Co., 54 Butler Ave., Detroit, Mich. "J-D." (See page 525.)
National Porcelain Co., Trenton, N. J.
Porcelain Products Co., Fulton Bldg., Pittsburgh, Pa.

PORTABLE BUFFERS—See Drills, Electric Portable

PORTABLE BUILDINGS—See Garages

PORTABLE CRANES—See Cranes, Portable

PORTABLE CYLINDER REBORING MACHINES—See Machines, Portable Cylinder Reboring and Regrinding

PORTABLE CYLINDER REGRINDING MACHINES—See Machines, Portable Cylinder Reboring and Regrinding

PORTABLE DRILLS—See Drills, Electric Portable

PORTABLE ELECTRIC LAMPS—See Lamps, Electric Hand or Inspection

PORTABLE GARAGES—See Garages, Portable

PORTABLE GRINDERS—See Drills, Electric Portable

PORTABLE HAND PUNCHES—See Punches, Portable Hand

PORTABLE MOTORS, MOTOR BOAT—See Motors, Motor Boat Outboard

PORTABLE POLISHERS—See Drills, Electric Portable

PORTABLE VISES—See Vises, Special and Portable

PORTABLE VULCANIZERS—See Vulcanizers, Portable

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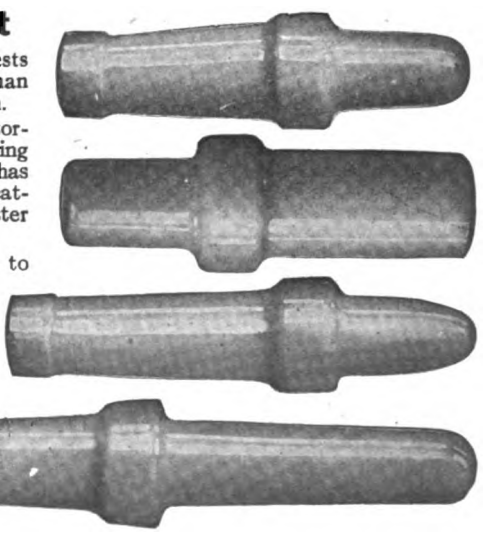

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POSTS, Tool

Armstrong Bros. Tool Co., 304 N. Francisco Ave., Chicago, Ill. (See page 773.)
O. K. Tool Holder Co., Shelton, Conn.

POWER HAMMERS—See Hammers, Power

POWER TRANSMITTING ATTACHMENTS—See Attachments, Power Transmitting

PRECISION LATHES—See Lathes, Bench

PRESERVERS, Aviators' Life

Ilanasilk—See Robinson-Roders Co.
Robinson-Roders Co., 27-33 N. J. R. R. Ave., Newark, N. J. "Ilanasilk."

PRESSED STEEL AXLE HOUSINGS—See Housings, Pressed Steel

PRESSED STEEL BRAKE DRUMS—See Drums, Brake

PRESSED STEEL FAN PULLEYS—See Pelleys, Pressed Steel Fan

PRESSED STEEL FRAMES—See Frames, Pressed Steel

PRESSED STEEL HUB FLANGES—See Flanges, Hub

PRESSED STEEL PARTS—See Stampings

PRESSED STEEL STEP HANGERS—See Hangers, Pressed Steel Step

PRESSED STEEL WHEELS—See Wheels, Pressed and Wrought Steel

PRESSES, Arbor

Atlas Press Co., 314 N. Park St., Kalamazoo, Mich. "Eames."
Barnes Co., W. F. & John, 301 S. Water St., Rockford, Ill.
Bartlett, Edwin E., 41 Crown St., Nashua, N. H. "Greenerd."
Craig Engineering Co., 1011 Santa Fe Ave., Los Angeles, Cal.
Eames—See Atlas Press Co.
Fox—See Sunderland Machinery Co.
Geier Co., P. A., Cleveland, O.
Greenerd—See Bartlett, Edwin E.
Lourie Mfg. Co., Harvard Pk., Springfield, Ill.
Lucas Machine Tool Co., E. 99th St. & L. S. & M. Ry., Cleveland, O.
McGregor—See U. S. Auto Bumper Co.
Manley—See United Engine & Mfg. Co.
Mayer, Irwin G., Coeur d'Alene, Idaho.
Mills Mfg. Co., Sabina, O.
Myers Machine Tool Co., Second & Chestnut Sts., Columbia, Pa.
Niles-Bement-Pond Co., 111 Broadway, New York, N. Y.
Post Garage & Repair Shop, Amos. Church St., Catskill, N. Y.
Sunderland Machinery Co., Omaha, Neb. "Fox." (See page 243.)
U. S. Auto Bumper Co., 115 E. 30th St., Chicago, Ill. "McGregor."
United Engine & Mfg. Co., Hanover, Pa. "Manley." (See page 239.)
Weaver Mfg. Co., 2173 S. Ninth St., Springfield, Ill.
Whitney Mfg. Co., R. S., Lewiston, Me.
Wilmarth & Morman Co., 1179 Monroe Ave., N. W., Grand Rapids, Mich.

PRESSES, Bench Straightening

Chambersburg Engineering Co., Derbyshire St., Chambersburg, Pa.
Geier Co., P. A., 5112 St. Clair Ave., E., Cleveland, O.
Springfield Machine Tool Co., Southern Ave. & P. C. & St. L. Ry., Springfield, O.
Towsley Co., John T., Gest & Evans Sts., Cincinnati, O.

PRESSES, Broaching

Bliss Co., E. W., 29 Adams St., Brooklyn, N. Y.
Burr & Sons, J. T., 429 Kent Ave., Brooklyn, N. Y.
Chambersburg Engineering Co., Derbyshire St., Chambersburg, Pa.
Consolidated Press & Tool Co., Hastings, Mich.
Lapointe Co., J. N., New London, Conn.
Lapointe Machine Tool Co., Hudson, Mass.
Perkins Machine Co., Warren, Mass.
Standard Machinery Co., Auburn, R. I. (See page 115.)
Watson-Stillman Co., 55 Church St., New York, N. Y.

PRESSES, Bushing Swedging

Beach—See Greb Co.
Greb Co., 195 State St., Boston, Mass. "Beach." (See page 531.)
Holmes, George L., 1733 Broadway, New York, N. Y. (Eastern Distributer for "Beach" Presses.) (See page 383.)

PRESSES, DEALERS IN—See Machinery, Dealers in

PRESSES, FORCING—See Presses, Arbor

PRESSES, Storage Battery Plate

(For straightening bent or buckled plates or forcing the active materials into place)

American Bureau of Engineering, 1018 S. Wabash Ave., Chicago, Ill. "Peers." (See page 855.)
Peers—See American Bureau of Engineering.

PRESSES, STRAIGHTENING—See Presses, Bench Straightening

PRESSES, Tire

Wellman-Seaver-Morgan Co., Cleveland, O.

PRESSINGS, METAL—See Stampings

PRESSURE LUBRICATORS—See Lubricators, Pressure

PRESSURE REGULATORS—See Regulators, Acetylene

PRESSURE SYSTEM TIRE CONNECTIONS—See Connections, Air System Tire

PRESSURE OR REDUCING VALVES—See Regulators, Tank Pressure

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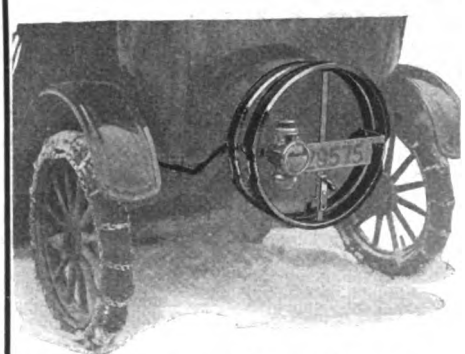

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PREVENTERS, GLARE—See Dimmers, Headlight

PREVENTERS, RUST—See Compounds, Rust Preventing and Removing

PRICK PUNCHES—See Punches, Center Prick and Drift

PRIMARY CABLE—See Wire, Insulated

PRIMER BUSHINGS—See Bushings, Starter or Primer Attaching

PRIMERS, Aircraft Wood and Metal

Valentine & Co., 456 Fourth Ave., New York, N. Y. "Valspar."

Valspar—See Valentine & Co.

PRIMERS, Engine

(See Heaters, Mixture; also Mixers, Fuel; also Starters)

A-V-G.—See Cox Brass Mfg. Co.

Bailey Co., W. J., Newark, N. J. "C. B."

Bay State Pump Co., 100 Purchase St., Boston, Mass. "Copley." (See page 533.)

Buckeye—See Central Brass & Fixture Co.

C. B.—See Bailey Co.

C-W—See Crum-Wiley Mfg. Co.

Central Brass & Fixture Co., Dept. A., Springfield, O. "Buckeye." (See page 137.)

Chi-Fau-Co.—See Chicago Faucet Co.

Chicago Faucet Co., 2712 N. Crawford Ave., Chicago, Ill. "Chi-Fau-Co."

Colonial Auto & Supply Co., 101 W. 66th St., New York, N. Y.

Copley—See Bay State Pump Co.

Cox Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y. "A-V-G."

Crone, F. G., 334 Genesee St., Buffalo, N. Y.

Crum-Wiley Mfg. Co., Peru, Ind. "C-W."

Engineering Equipment Co., State Life Bldg., Indianapolis, Ind.

Gilson Motor Starting Co., 940 N. Pennsylvania St., Indianapolis, Ind.

Hagstrom Bros. Mfg. Co., Lindsborg, Kans.

Ideal Brass Works, 560 N. Elder Ave., Indianapolis, Ind.

Imperial Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill. "Prime-ur." (See page 733.)

Injex—See Reflex Ignition Co.

Jiffy Jack Co., 10209 Quincy Ave., Cleveland, O.

Jorgenson Mfg. Co., Waupaca, Wis.

Lunkenheimer Co., Beekman & Waverly Sts., Cincinnati, O.

Maltby Auto Specialty Co., 303 W. Main St., Battle Creek, Mich.

Master Primer Co., 34 E. Larned St., Detroit, Mich.

Motor Cooling System Co., Charles & Lombard Sts., Baltimore, Md.

National Mfg. Co., 227 Portage St., Kalamazoo, Mich.

Perkins Appliance Co., 4 Birnie Ave., Springfield, Mass. "Victory."

Prime-ur—See Imperial Brass Mfg. Co.

Reflex Ignition Co., 1710 Payne Ave., Cleveland, O. "Injex." (See page 595.)

Victory—See Perkins Appliance Co.

Walker & Co., W. T., 11 Pemberton Sq., Boston, Mass.

PRIMERS, Engine, for Fords

(See also Heaters, Mixture; also Mixers, Fuel; also Starters)

Bear Mfg. Co., E. 17th St. & First Ave., Rock Island, Ill.

Gould Mfg Co., Union Trust Bldg., Cincinnati, O.

Henes Sales Corp., 462 Deming Pl., Chicago, Ill.

Home Light Co., 3353 Milwaukee Ave., Chicago, Ill.

J. & B. Mfg. Co., Pittsfield, Mass.

Jorgensen Mfg. Co., Waupaca, Wis.

King, W. C., 911 Sargent St., Litchfield, Ill.

Maltby Auto Specialty Co., 303 W. Main St., Battle Creek, Mich.

Nelson Mfg. Co., A., 2700 Southport Ave., Chicago, Ill.

Smith, Fred, West Park Pl., Stamford, Conn.

Zimmerman's Garage, 247 W. Main St., Valparaiso, Ind.

PRIMING CUPS—See Cups, Spring Key Priming

PRIMING PLUGS FOR FORDS—See Plugs, Special

PRODUCERS, Motor Boat Gas

Galucha—See Nelson Blower & Furnace Co.

Nelson Blower & Furnace Co., South Boston, Mass. "Galucha."

PROPELLER BLADE SHAPERS, AIRCRAFT—See Machines, Aircraft Propeller Blade Shaping

PROPELLER HUB BORERS—See Machines, Aircraft Propeller Hub Boring

PROPELLER BORING MACHINES—See Machines, Propeller Boring

PROPELLER HUB BOLTS, AIRCRAFT——See Bolts, Aircraft Propeller Hub

PROPELLER HUB BORING MACHINES—See Machines, Aircraft Propeller Hub Boring

PROPELLER HUB FLANGES, AIRCRAFT—See Hubs, Aircraft Propeller

PROPELLER HUBS, AIRCRAFT—See Hubs, Aircraft Propeller

PROPELLER SHAFT STEADY BEARINGS—See Bearings, Drive Shaft Steady

PROPELLER SHAFTS—See Shafts, Propeller

PROPELLER TOOTHING MACHINES, AIRCRAFT—See Machines, Aircraft Propeller Toothing

PROPELLER TURNING LATHES, AIRCRAFT—See Lathes, Aircraft Propeller Turning

PROPELLER VISE STANDS—See Stands, Aircraft Propeller Vise

PROPELLER WHEELS, MOTOR BOAT—See Wheels, Motor Boat Propeller

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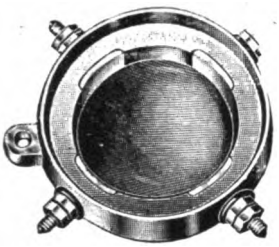

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Alamo—See Steves Sash & Door Co.
American Propeller & Mfg. Co., Baltimore, Md. "Paragon."
American Sash & Door Co., 16th St. & Bellefontaine Ave., Kansas City, Mo.
Doyle, W. A., Trenton, N. J.
Falcon—See Jamestown Propeller Co.
Flottorp Mfg. Co., 4611 W. 12th St., Chicago, Ill.
Hartzell Walnut Propeller Co., Piqua, O. "Liberty."
Holbrook Co., 166 West End Ave., New York, N. Y.
Jamestown Propeller Co., Jamestown, N. Y. "Falcon."
Jacuzzi Bros., 2034 San Pablo Ave., Berkeley, Cal.
Lang Propeller Co. of America, 505 Fifth Ave., New York, N. Y.
Liberty—See Hartzell Walnut Propeller Co.
Marble Chair Co., B. L., Bedford, O.
Paragon—See American Propeller Mfg. Co.
Peck & Co., Hardman, New York, N. Y.
Steves Sash & Door Co., San Antonio, Tex. "Alamo."
Stone Propeller Co., 12 Michigan Ave., Dayton, O. "Supreme."
Supreme—See Stone Propeller Co.
United States Aero Propeller Co., Becher & Greenbush Sts., Milwaukee, Wis.
West Woodworking Co., 308-24 N. Ada St., Chicago, Ill. "Westmore."
Westmore—See West Woodworking Co.
White Co., George D., 107-21 E. 49th St., Los Angeles, Cal.

PROPELLERS, MOTOR BOAT — See Wheels, Motor Boat Propeller

PROPS OR SUPPORTS, CAR—See Jacks, Tire Saving

PROTECTORS, Aeroplane, Rubber Fuselage Wire

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PROTECTORS, CUFF—See Protectors, Sleeve

PROTECTORS, EYE—See Goggles, Mechanics'

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B. E. Mfg. Co., 18-22 W. 18th St., New York, N. Y. (See page 223.)
Ero Mfg. Co., 700 W. 22d St., Chicago, Ill.
Niagara Fabric Mfg. Co., 47 Greene St., New York, N. Y.

PROTECTORS, TIRE—See Treads, Detachable; also Shoes, Inner Tire

PULLERS, Axle Housing, for Fords

(Tool for separating propeller shaft housing from differential housing)

Handee—See Racine Handy Mfg. Co.
Racine Handy Mfg. Co., 107 Fifth St., Racine, Wis. "Handee."
Universal Mfg. Co., Racine, Wis.

PULLERS, Bearing

Campbell Auto Works, 238-40 N. Eldorado St., Stockton, Cal.

PULLERS, BUSHING, FOR FORDS — See Extractors, Bushing

PULLERS, CAR—See Winches and Blocks

PULLERS, Cotter Pin

Auto Forge Sales Co., Columbus, O.
Braunsdorf-Mueller Co., 205 Madison St., Elizabeth, N. J.
Buffum Tool Co., Louisiana, Mo. (See page 707.)
Carver Tool Works, Spring Valley, N. Y.
Clinton Machine Works, 460 High St., Clinton, Mass.
Cushman Auto Tool Co., Neil & Green Sts., Champaign, Ill.
E-Z—See Syracuse Wrench Co.
Kraeuter & Co., 571-85 18th Ave., Newark, N. J.
Marcy Tool Works, Putnam, Conn.
Milwaukee Tool & Forge Co., 220 Becher St., Milwaukee, Wis.
Mossberg Co., Frank, Attleboro, Mass. (See page 769.)
Mound Tool Co., Dept. D, Seventh & Hickory Sts., St. Louis, Mo. (See page 789.)
Osborne & Co., C. S., Harrison, N. J.
S. & I. Co., 55-57 Governor St., Springfield, Mass.
Stortz & Son, John, Philadelphia, Pa.
Syracuse Twist Drill Co., 936 Grape St., Syracuse, N. Y.
Syracuse Wrench Co., Syracuse, N. Y. "E-Z." (See page 773.)
Vaughan & Bushnell Mfg. Co., 2114-38 Carroll Ave., Chicago, Ill.
Vichek Tool Co., 10709 Quincy Ave., Cleveland, O.

PULLERS, Gear and Wheel

Beach—See Greb Co.
Braunsdorf-Mueller Co., 205 Madison St., Elizabeth, N. J.
Collison, George A., 181 St. Paul St., Burlington, Vt.
Crane Puller Co., 54 Lake St., Arlington, Mass.
Greb Co., 195 State St., Boston, Mass. "Beach." (See page 531.)
Holmes, George L., 1733 Broadway, New York, N. Y. (Eastern Distributor for "Beach" Pullers.) (See page 383.)
Kerschbaum, M. E., New York, N. Y.
Little Giant—See Premier Electric Co.
Miller Machine & Tool Co., Bryan, O.
Polson Mfg Co., 1754 Main St., Buffalo, N. Y.
Premier Electric Co., 4034 Ravenswood Ave., Chicago, Ill. "Little Giant."

PULLERS, WHEEL—See Pullers, Gear

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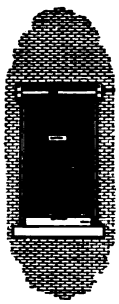

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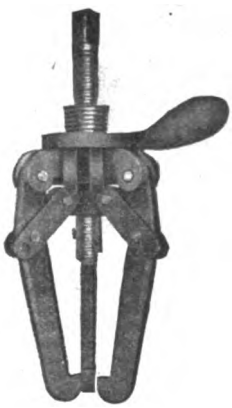

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PULLERS, Wheel, for Fords

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American Machine Products Co., Marshalltown, Ia. (See page 523.)
Benford Mfg. Co., Box H, Mt. Vernon, N. Y. (See page 517.)
Central Brass & Fixture Co., Dept. A, Springfield, O. (See page 137.)
Central Foundry Co., Marshalltown, Ia.
Cooper Mfg. Co.—See Fulton Co.
Crum-Wiley Mfg. Co., Peru, Ind.
E. G.—See Grossman Mfg. Corp.
Easy-Off—See Honn, Peter.
Edelmann & Co., E., 341-63 E. Ohio St., Chicago, Ill. "Ten Eyck."
Evergood—See Grossman Mfg. Corp.
Fulton Co., 1910 St. Paul Ave., Milwaukee, Wis. (Sole Distributors for Cooper Mfg. Co., Marshalltown, Ia. (See page 139.)
Greer, Frederic, 525 W. Van Buren St., Chicago, Ill.
Grossman Mfg. Corp., Emil, Bush Terminal Bldg. No. 20, Brooklyn, N. Y. "Evergood."
Honn, Peter, 578 Stocking Ave., Grand Rapids, Mich. "Easy-Off." (See page 703.)
Metal Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.
Mosco—See Motor Specialties Co.
Mossberg Co., Frank, Attleboro, Mass. (See page 769.)
Motor Specialties Co., Pine St., Waltham, Mass. "Mosco."
Nelson Mfg. Co., A., 2700 Southport Ave., Chicago, Ill.
Whitehouse-LeCompte Mfg. Co., 42-54 Elm St., Newark, N. J.

PULLEY COVERS, CORK—See Covers, Cork Pulley Rim

PULLEYS, FAN—See Pulleys, Pressed Steel Fan

PULLEYS, Pressed Steel, Fan

(See also Fans, Radiator)

Michigan Engine Valve Co., 115-17 Columbia St., W., Detroit, Mich. (See page 739.)

PULLEYS AND SHEAVES—See Sheaves and Pulleys

PUMP CONNECTION WASHERS—See Washers, Tire Pump Connection

PUMP CONNECTIONS—See Connections, Tire Pump

PUMP COUPLINGS—See Couplings, Magneto

PUMP SYSTEMS—See Systems, Magnetic Pump Gasoline

PUMP WASHERS—See Washers, Leather

PUMPS, AIR—See Pumps, Engine Driven; also Pumps, Foot; also Pumps, Garage; for Steam Air Pumps—See Pumps, Steam Air

PUMPS, Aeroplane Fuel

H. & N. Carburetor Co., 138 West Ave., Long Island City, N. Y.

PUMPS, Aircraft Water Circulating

Atlas Brass Foundry Co., Columbus, O. (See page 539.)
Atlas Mfg. Co., 980 S. Park St., Columbus O.
Fulfo Pump Co., 126 Opera Pl., Blanchester, O.

PUMPS, BOILER FEED—See Pumps, Steam Boiler Feed

PUMPS, CIRCULATING—See Pumps, Water Circulating; also Pumps, Aircraft Water Circulating; also Pumps, Motor Boat

PUMPS, Engine Driven Tire

Advance Machinery Co., Van Wert, O.
Bay State Pump Co., 100 Purchase St., Boston, Mass. "Crane." (See page 533.)
Brown Co., 213 Bellevue Ave., Syracuse, N. Y.
Cassco—See West Side Foundry Co.
Champion, F. M., 236 Elizabeth St., Utica, N. Y.
Colstad Sales Co., 48 Binford St., Boston, Mass.
Crane—See Bay State Pump Co.
Detroit Accessories Corp., Detroit, Mich. (See page 533.)
E-Z—See Wheaton & Co.
E-Z—See Wissler Instrument Works.
General Utility Co., 1326-30 Ogden St., Philadelphia, Pa.
Hartford Machine Screw Co., Hartford, Conn. "Master." (See page 513.)
Hill Pump Valve Co. See Zinke Co.
Hilton Universal Pump Co., 170 Summer St., Boston, Mass.
Houser Machine & Mfg. Co., 232 Mill St., Rochester, N. Y.
Judd & Leland Mfg. Co., Clifton Springs, N. Y. "Juleco." (See page 535.)
Juleco—See Judd & Leland Mfg. Co.
Keene Mfg. Co., Keene, N. H.
Kellogg Mfg. Co., Rochester, N. Y. (See page 533.)
Lipman Air Appliance Co., 206 Pleasant St., Beloit, Wis.
Manzel Bros. Co., 320 Babcock St., Buffalo, N. Y.
Master—See Hartford Machine Screw Co.
Mayo-Skinner Mfg. Co., 2115 Elston Ave., Chicago, Ill. (See page 539.)
Medina Machine Co., Medina, O.
Motors Appliance Co., East Moline, Ill., (See page 781.)
National Motor Supply Co., Painesville, O.
R-F—See Rauber-Fien Mfg. Co.
Roll-On—See V Air Valve & Mfg. Co.
S-H Pump Co., 2440 W. 34th Pl., Chicago, Ill.
Smith, Irvin C., 855 S. Los Angeles St., Los Angeles, Cal.
Stewart-Warner Speedometer Corp., Chicago, Ill. (See page 499.)
Taylor Mfg. Co., 28 Lasher Ave., Redford, Mich.
Utility—See Zinke Co.
V Air Valve & Mfg. Co., 1648 Tremont St., Denver, Colo. "Roll-On."
West Side Foundry Co., Troy, N. Y. "Cassco."
Wheaton & Co., C. M. Sunbury, Ohio. "E-Z."
Wissler Instruments Works, A., Broadway & Washington St., St. Louis, Mo. "E-Z"
Zinke Co., 1323-25 Michigan Ave., Chicago, Ill. (Sole Distributors for Hill Pump Valve Co., Chicago, Ill. "Utility.") (See page 551.)

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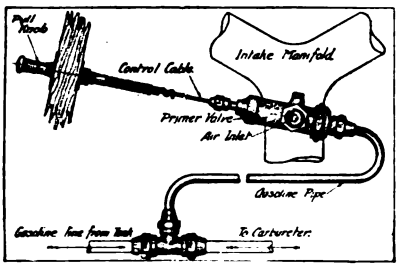
THE COPLEY PRIMER

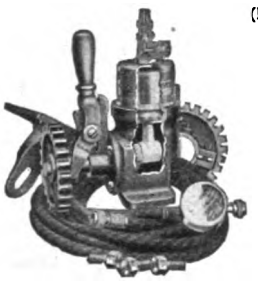
MINIATURE STARTING CARBURETER

For facilitating starting of cold motors. Price, $5.00



CRANE TIRE PUMP

(ENGINE-DRIVEN)



The Pump with the endless, slotless ring.

Price, $12.00

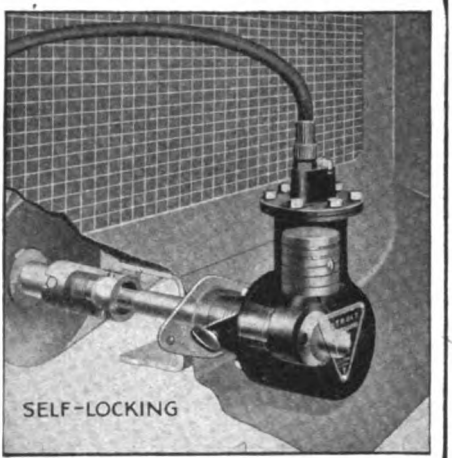
BAY STATE PUMP COMPANY

100 Purchase Street :: Boston, Mass.

Gearless DETROIT Crank-Shaft TIRE-PUMP

Patented Aug. 24, 1915

Carried in Tool-Kit. Attached like Hand-Crank



Built Like Your Motor

Not a Rubber Diaphragm Device—No Tools—No Work—No Change—Oil-Proof—Guaranteed for Life

$12.00 Complete

Including a 14-foot hose and "Thumlock" for

BRISCOE 4-24 HUDSON REO
DODGE HUPP R. STUDEBAKER
CHANDLER OVERLAND

DETROIT ACCESSORIES CORP'N
Detroit, Mich.

KELLOGG ENGINE DRIVEN Tire-Pump

Engine-Driven Tire Pumps

Electric Motor-Driven Air Compressors

Combination Grease and Oil Guns

Hand Tire Pumps of all types

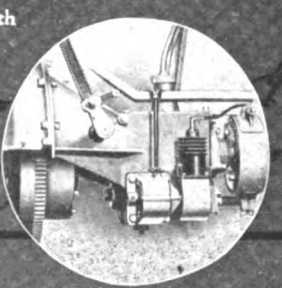
Unequalled quality has placed the Kellogg Engine-Driven Pump as standard equipment on 90% of all fully equipped motor cars, in use by over a half million motorists in this country, and on the pneumatic-tired trucks here and at the battlefront in France.

The same guarantee of excellence applies to the whole Kellogg Line.

Quality is always worth buying.

KELLOGG MFG. CO.

Rochester, New York



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PUMPS, Engine Driven Tire, for Fords

Advance Machinery Co., Van Wert, O.
Brown Co., 213 Bellevue Ave., Syracuse, N. Y. "San Ford."
Cassco—See West Side Foundry Co.
Colstad Sales Co., 48 Binford St., Boston, Mass.
Danvers Specialty Co., Danvers, Ill.
Hill Pump Valve Co.—See Zinke Co.
Judd & Leland Mfg. Co., Clifton Springs, N. Y. "Juleco." (See page 535.)
Juleco—See Judd & Leland Mfg. Co.
Kellogg Mfg. Co., Rochester, N. Y. (See page 533.)
Manzel Bros. Co., 320 Babcock St., Buffalo, N. Y.
Marvel Accessories Mfg. Co., 900 Marvel Bldg., Cleveland, O. (See page 763.)
Mayo-Skinner Mfg. Co., 2115 Elston Ave., Chicago, Ill. (See page 539.)
National Motor Supply Co., Painesville, O.
Pittsburgh Auto Equipment Co., Baum & Beatty Sts., Pittsburgh, Pa. "Union."
San Ford—See Brown Co.
Union—See Pittsburgh Auto Equipment Co.
Utility Junior—See Zinke Co.
West Side Foundry Co., Troy, N. Y. "Cassco."
Zinke Co., 1323-25 Michigan Ave., Chicago, Ill. (Sole Distributors for Hill Pump Valve Co., Chicago, Ill. "Utility Junior.") (See page 551.)

PUMPS, Foot Tire

Auto Pedal Pump Co.—See Cassidy Co.
Cassidy Co., Edward A., 280 Madison Ave., New York, N. Y. (Sales Department for Auto Pedal Pump Co., New York, N. Y. "Twombly." (See page 71.)
Service Mfg. Co., 211-13 Center St., New York, N. Y. (See page 529.)
Twombly—See Cassidy Co.

PUMPS, GARAGE GASOLINE—See Tanks, Gasoline Storage

PUMPS, GASOLINE FEED—See Systems, Magnetic Pump

PUMPS, Hand Tire

Aeolus—See Bridgeport Brass Co.
Anthony Co., Long Island City, N. Y. (See page 535.)
Apex Electric Mfg. Co., 1410 W. 59th St., Chicago, Ill. "Yankee."
Atlas—See Bridgeport Brass Co.
Bell Pump & Mfg. Co., 74-78 Fort St., E., Detroit, Mich.
Bishop-Babcock-Becker Co., E. 49th St. & Hamilton Ave., Cleveland, O.
Blizzard—See Bridgeport Brass Co.
Boss—See Cox Brass Mfg. Co.
Bridgeport Brass Co., E. Main St., Bridgeport, Conn. "Stapley," "Æolus," "Atlas," "Windjammer," "Crown."
Brisk Blast Mfg. Co., Monroe, Mich.
Brown Co., 213 Bellevue Ave., Syracuse, N. Y.
Carver—See Osborne & Stephenson Mfg. Co.
Cleveland Faucet Co., 708 Frankfort Ave., N. W., Cleveland, O.
Codman & Shurtleff, 120 Boylston St., Boston, Mass.
Coe-Stapley Mfg. Co., 1565 Railroad Ave., Bridgeport, Conn. "Rex," "Little Giant."
Columbia—See Judd & Leland Mfg. Co.
Corcoran Mfg. Co., 4634 Spring Grove Ave., Cincinnati, O. "Peerless."
Cox Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y. "Boss," "Handy," "Reliable."
Crown—See Bridgeport Brass Co.
Cyclone—See Judd & Leland Mfg. Co.
Eureka—See Judd & Leland Mfg. Co.
Excel—See Judd & Leland Mfg. Co.
E-Z-Quick—See Mayo-Skinner Mfg. Co.
Freeman Brass Works, 92 Bowery, New York, N. Y.
Generator Valve Co., 47 Dinsmore Pl., Brooklyn, N. Y. "James."
Gleason-Peters Air Pump Co., 384 Classon Ave., Brooklyn, N. Y.
Handy—See Cox Brass Mfg. Co.
Haney & Co., J. H., Hastings, Neb. "Rose."
Harlem—See Judd & Leland Mfg. Co.
Hill—See Judd & Leland Mfg. Co.
Holmes, George L., 1783 Broadway, New York, N. Y. (Eastern Distributor for Anthony Pumps.) (See page 383.)
Howell Co., W. H., Geneva, Ill. "Jensen."
Ideal—See Noera Mfg. Co.
Imperial Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill. "Wixon." (See page 783.)
Inland Pump Mfg. Co., 609-12 Reaper Blk., Chicago, Ill. (See page 535.)
J-K—See Jensen-Kohlert Mfg. Co.
James—See Generator Valve Co.
Jensen—See Howell Co.
Jensen-Kohlert Mfg. Co., 512 W. Second St., St. Charles, Ill. "J-K."
Judd & Leland Mfg. Co., Clifton Springs, N. Y. "Eureka," "Columbia," "Tornado," "Cyclone," "Hill," "Victor," "Excel," "Harlem." (See page 535.)
Kellogg Mfg. Co., Rochester, N. Y. (See page 533.)
Little Giant—See Coe-Stapley Mfg. Co.
Marvel—See St. Charles Specialty Mfg. Co.
Mayo-Skinner Mfg. Co., 2115 Elston Ave., Chicago, Ill. "Skinner," "E-Z-Quick." (See page 539.)
Moon Bros. Mfg. Co., St. Louis, Mo.
No. 99—See Stevens & Co.
Noera Mfg. Co., 21-97 Griggs St., Waterbury, Conn. "Red Devil," "Ideal," "Waterbury."
Osborne & Stephenson Mfg. Co., Plainville, Conn. "Carver."
Peerless—See Corcoran Mfg. Co.
Protex Mfg. Co., 13-17 N. Jefferson St., Chicago, Ill. (See page 275.)
Red Devil—See Noera Mfg. Co.
Red Wonder—See Sidel-Rattner Mfg. Co.
Reliable—See Cox Brass Mfg. Co.
Rex—See Coe-Stapley Mfg. Co.
Rose—See Haney & Co.
Shawver Co., rear 31 W. Pleasant St., Springfield, O. "Springfield."
Sidel-Rattner Mfg. Co., 31-35 Broadway, Brooklyn, N. Y. "Red Wonder."
Skinner—See Mayo-Skinner Mfg. Co.
Springfield—See Shawver Co.
Stapley—See Bridgeport Brass Co.
Stevens, C. S., 680 W. Main St., New Britain, Conn.
Stevens & Co., 375 Broadway, New York, N. Y. "No. 99."
Sunderland Mfg. Co., 602 W. 22d St., Chicago, Ill. (See page 401.)
Tornado—See Judd & Leland Mfg. Co.
Turner Brass Works, Sycamore, Ill.
Victor—See Judd & Leland Mfg. Co.
Waterbury—See Noera Mfg. Co.
Windjammer—See Bridgeport Brass Co.
Wixon—See Imperial Brass Mfg. Co.
Yankee—See Apex Electric Mfg. Co.

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ANTHONY TIRE PUMP

The Anthony Tire Pump possesses five advantages over other foot pumps, which are as follows:

1. A Handle that cannot work loose. A perfect grip. Easy on hand and wrist.
2. A Piston Rod that cannot bend or spring. Large diameter. Solid. Extra strong.
3. A Cup Leather that gives 100% compression with minimum effort. Specially treated. Exactly fitted.
4. A Foot Base that grasps the ground. Affords a stable bearing. Large area. Unbreakable.
5. A Valve that conserves effort and insures highest pump efficiency. A patented all metal check valve of instant action and perfect balance. Absolutely air tight.

Send us your order today—you will never regret having in stock Anthony Tire Pumps—in fact, you'll find it a difficult matter to keep them in stock once you let the motorists in your town know that you sell this remarkable pump—made in three sizes for small, medium and big cars.

Retail any size $4.00.

The Anthony Company, Long Island City, N. Y.

Inland I-X-L *Pump*

The Original Running Board Pump

Makes Tire Pumping Easy

Any car owner will appreciate one of these wonderful easy working tire pumps. **The most powerful compact pump made.**

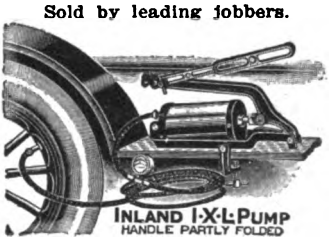
It develops a leverage "18 times" the ordinary foot pump. Clamps to either running board — has folding handle and folding clamp. Size folded 3x4½x13½ inches, to fit tool box.

All steel and malleable iron and made to last.

Price Complete With Hose $6.00

Including Gauge $7.00.

Sold by leading jobbers.



INLAND PUMP MFG. CO.

609-612 Reaper Blk., CHICAGO, ILL.

THE VICTOR
3 CYLINDER

Cylinders
Seamless Brass

Plungers
Selected Stock

Finish
Lacquered Brass

25 in case—200 lbs.

THE EXCEL
3 CYLINDER

Cylinders
Steel

Plungers
Selected Stock

Finish
Brass Plated and Lacquered

25 in case—215 lbs.

No. 11 TORNADO
1 CYLINDER

Cylinders
Brass or Steel

Finish
Brass Lacquered and Black Enamel

50 in case—155 lbs.

No. 1 CYCLONE
2 CYLINDER

Cylinders
Brass or Steel

Finish
Brass Lacquered and Black Enamel

25 in case—120 lbs.

JUDD & LELAND MFG. CO. Clifton Springs, N. Y.

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PUMPS, Motor Boat Engine Driven Bilge

(See also Boilers, Automatic Bilge)

Bevin Bros. Mfg. Co., East Hampton, Conn.
Generator Valve Co., 47 Dinsmore Pl., Brooklyn, N. Y. "James."
James—See Generator Valve Co.
Lobee Pump & Machinery Co., 119 Dearborn St., Buffalo, N. Y.
Monarch Valve Co., 112 Front St., Brooklyn, N. Y.

PUMPS, Motor Boat Water Circulating

Atlas Brass Foundry Co., Columbus, O. (See page 539.)
Fulfo Pump Co., 126 Opera Pl., Blanchester, O.
Lipman Refrigerator-Car & Mfg. Co., 206 Pleasant St., Beloit, Wis.
Lobee Pump & Machinery Co., 111-19 Dearborn St., Buffalo, N. Y.

PUMPS, OIL—See Lubricators

PUMPS, Motorcycle Tire

Bridgeport Brass Co., E. Main St., Bridgeport, Conn.

PUMPS, POWER TIRE—See Pumps, Engine Driven; also Pumps, Garage

PUMPS, Steam Air

(For keeping air pressure on fuel tanks of steam cars)

American Steam Pump Co., Battle Creek, Mich. "Marsh."
Marsh—See American Steam Pump Co.
Union Steam Pump Co., Battle Creek, Mich.

PUMPS, TIRE—See Pumps, Engine Driven; also Pumps, Foot; also Pumps, Hand; also Pumps, Garage

PUMPS, Steam Boiler Feed

(For feeding boilers of steam cars)

American Steam Pump Co., Battle Creek, Mich. "Marsh."
Marsh—See American Steam Pump Co.
Union Steam Pump Co., Battle Creek, Mich.

PUMPS, Tractor Water Circulating

Atlas Brass Foundry Co., Columbus, O. (See page 539.)
Fulfo Pump Co., 126 Opera Pl., Blanchester, O.
Lobee Pump & Machinery Co., 119 Dearborn St.. Buffalo, N. Y.

PUMPS, Water Circulating

Atlas Brass Foundry Co., Columbus, O. (See page 539.)
Doehler Die-Casting Co., Brooklyn, N. Y. (See page 181.)
Fulfo Pump Co., 126 Opera Pl., Blanchester, O.
Imperial Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill. (See page 733.)
Lee Co., Wm. O., Port Huron, Mich.
Lipman Refrigerator-Car & Mfg. Co., 206 Pleasant St.; Beloit, Wis.
Lobee Pump & Machinery Co., 111-19 Dearborn St., Buffalo, N. Y.
Motor Cooling System Co., Charles & Lombard Sts., Baltimore, Md.
Oberdorfer Brass Co., M. L., 804 E. Water St., Syracuse, N. Y.
Sparks-Withington Co., Jackson, Mich.
Tulfo Pump Co., 128 Opera Pl., Cincinnati, O.

PUMPS, Water Circulating, for Fords

(Auxiliary water circulators)

Crum-Wiley Mfg. Co., Peru, Ind.
Dual Mfg. Co., 1202 Hennepin Ave., Minneapolis, Minn.
G. P. Sales Co., 1806 Michigan Ave., Chicago, Ill. (See page 675.)
General Metals Co., 265 E. Jefferson St., Detroit, Mich. "Serkulater."
Giddings & Lewis Mfg. Co., 142 Doty St., Fond du Lac, Wis.
Little Wonder—See Riverside Specialty Co.
Michigan Auto Products Co., Detroit, Mich. "Ospeco." (See page 605.)
Motor Cooling System Co., Charles & Lombard Sts., Baltimore, Md.
Ospeco—See Michigan Auto Products Co.
Parker White Metal & Machine Co., 23d & Railroad Sts., Erie, Pa. (See page 655.)
Riverside Specialty Co., Riverside, Cal. "Little Wonder."
Security Co., 56 Terminal Way, Pittsburgh, Pa.
Serkulater—See General Metals Co.
Schilling Mfg. Co., 928-30 Pacific Ave., Long Beach, Cal. "Vanreush."
Vanreush—See Schilling Mfg. Co.

PUMPS and AIR COMPRESSORS, Garage

Aalding—See Franklin Machine Co.
Air Device Co., 2975-77 Cottage Grove Ave., Chicago, Ill. "Ten Eyck."
Akron-Williams—See Williams Foundry & Machine Co.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American Electric Air Pump Co., 220 Penn Ave., Pittsburgh, Pa.
American Steam Pump Co., Battle Creek, Mich.
Apex Electric Mfg. Co., 1410 W. 59th St., Chicago, Ill.
Au-To Compressor Co., Wilmington, O.
Bastian Auto Engineering Works, (Olney) Philadelphia, Pa.
Beach-Russ Co., 220 Broadway, New York, N. Y.
Binks—See Star Brass Works.
Bishop-Babcock-Becker Co., E. 49th St. & Hamilton Ave., Cleveland, O. "Eureka."
Black & Decker Mfg. Co., 119 Hollingsworth St., Baltimore, Md. "Lectroflater." (See page 323.)
Blaisdell Machine Co. (So. Bradford), Bradford, Pa.
Brown Beer Pump Co., E. R., 11 Chardon St., Boston, Mass. "Success."
Brunner Mfg. Co., Broad & Gilbert Sts., Utica, N. Y.
Caldwell, Robinson & Vandemark, 74 Cortlandt St., New York, N. Y.
Champion—See Cleveland Faucet Co.
Champion, F. M., 236 Elizabeth St., Utica, N. Y.
Clayton—See International Steam Pump Co.
Cleveland—See National Motor Supply Co.
Cleveland Faucet Co., 708 Frankford Ave. N. W., Cleveland, O. "Champion."

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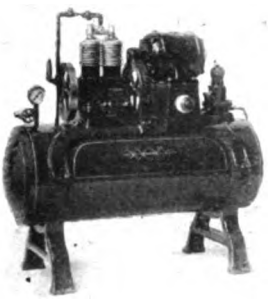
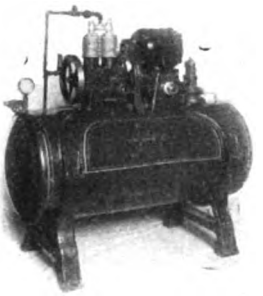
Union Air Compressors





Model 35 Stationary Outfit

Bore—2¼ inches. Stroke—2 inches.

Capacity—4 cubic feet free air per minute.

Speed of compressor—450 R.P.M.

Lubrication—Splash System.

Equipment—Twin-cylinder compressor, ½ H.P. highest grade motor and Union Automatic Control mounted on solid cast iron base which is fitted to top of tank; 14 x 36" Tank (150 lbs. working pressure) with pressure gauge, safety valve, globe valve, check valve and switch; 5 ft. BX Cable for electric connection and 25 ft. heavy armored hose with Hansen Air Chuck and Hansen Hose Couplings. Price—$270.

Model 20 Portable Compressor

Bore—2¼ inches. Stroke—2 inches.

Capacity—4 cubic feet free air per minute.

Speed of compressor—450 R.P.M.

Lubrication—Splash System.

Equipment—Twin-cylinder compressor, ½ H.P. highest grade motor; 20 ft. water and oil proof two-way connection cord; 17 ft. special grade rubber hose with pressure gauge and Thum-lock valve connection. Price—$165.

Model 45 Stationary Outfit

Bore—2¼ inches. Stroke—2 inches.

Capacity—4 cubic feet free air per minute.

Speed of compressor—450 R.P.M.

Lubrication—Splash System.

Equipment—Twin-cylinder compressor, ½ H.P. highest grade motor and Union Automatic Control mounted on solid cast iron base which is fitted to top of tank; 18 x 42" Tank (150 lbs. working pressure) with pressure gauge, safety valve, globe valve, check valve and switch; 5 ft. BX Cable with switch-plug and 25 ft. heavy armored hose with Hansen Automatic Air Chuck and Hansen Hose Couplings. Price—$290.

Model 40 Portable Tank Outfit

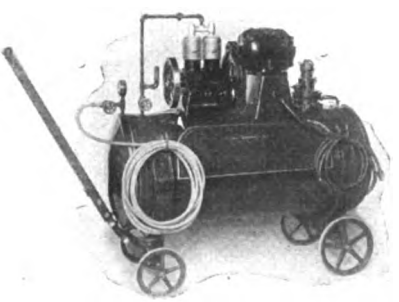
Bore—2½ inches. Stroke—2 inches.

Capacity—4 cubic feet free air per minute.

Speed of compressor—450 R.P.M.

Lubrication—Splash System.

Equipment—Twin-cylinder compressor, ½ H.P. highest grade motor and Union Automatic control mounted on solid cast iron base which is fitted to top of tank; 18 x 42" Tank (150 lbs. working pressure) with pressure gauge, safety valve, globe valve, check valve and switch; 20 ft. heavy electric connecting cord with switch-plug and 20 ft. of special rubber hose with Hansen Air Chuck. Price—$300.



UNION ENGINE & MANUFACTURING COMPANY

BUTLER, PA.

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PUMPS and AIR COMPRESSORS, Garage (Continued)

Comstock Mfg. Co., 1311 Dempster St., Evanston, Ill. "Trojan."

Curtis Penumatic Machinery Co., 1622 Kienlen Ave., St. Louis, Mo.

Davis—See Hinkley Machine Works

Dead Easy—See Globe Mfg. Co.

Deming Co., Salem, O.

Eureka—See Bishop-Babcock-Becker Co.

Eureka Air Compressor Co., 242 Glenwood Ave., Bloomfield, N. J.

Fairbanks, Morse & Co., 900 S. Wabash Ave., Chicago, Ill.

Faultless Engine Co., 1511 Cypress St., Kansas City, Mo.

Fero Electric Air Pump Co., Pittsburgh, Pa.

Fort Wayne Engineering & Mfg. Co., Fort Wayne, Ind. "Paul."

Fox—See Sunderland Machinery Co.

Franklin Machine Co., Main St. Station, Franklin, N. H. "Aalding."

Franklin Mfg. Co., 217-19 N. Watts St., Philadelphia, Pa. "Landis."

Gardner Governor Co., Quincy, Ill. "Gee Gee."

Gee Gee—See Gardner Governor Co.

General Utility Co., 1326-30 Ogden St., Philadelphia, Pa. "Guco."

Gifford Engine Co., Lansing, Mich.

Gleason-Peters Air Pump Co., 384 Classon Ave., Brooklyn, N. Y.

Globe Mfg. Co., 64 Grant St., Battle Creek, Mich. "Dead Easy."

Green Auto Specialties Co., 53 W. Jackson Blvd., Chicago, Ill.

Guco—See General Utility Co.

Hale Electric & Engineering Co., Schofield Bldg., Cleveland, O.

Hartford Machine Screw Co., Hartford, Conn. "Master." (See page 513.)

Hayward Tire & Equipment Co., Indianapolis, Ind.

Herz Minimax—See Pro-Mo-Tor.

Herz Tandem—See Pro-Mo-Tor.

Hinckley Machine Works, Hinckley, Ill. "Davis."

Imperial—See Ingersoll-Rand Co.

Ingersoll-Rand Co., 11 Broadway, New York, N. Y. "Imperial."

International Steam Pump Co., 115 Broadway, New York, N. Y. "Clayton."

Kellogg Mfg. Co., Rochester, N. Y. (See page 533.)

Kewanee Private Utilities Co., Kewanee, Ill.

Landis—See Franklin Mfg. Co.

Lectroflater—See Black & Decker Mfg. Co.

Lipman Air Appliance Co., 206 Pleasant St., Beloit, Wis.

Lipman Refrigerator-Car & Mfg. Co., 206 Pleasant St., Beloit, Wis.

Little Giant—See Orange Machine & Mfg. Co.

Manley—See United Engine & Mfg. Co.

Master—See Hartford Machine Screw Co.

Mayo-Skinner Mfg. Co., 2115 Elston Ave., Chicago, Ill. (See page 539.)

Mueller, Wm. F., Farwell Ave. & Brady St., Milwaukee, Wis.

National Brake & Electric Co., Larkin St. & Belleview Pl., Milwaukee, Wis.

National Motor Supply Co., Painesville, O. "Cleveland."

National-Standard Co., Niles, Mich. (See page 371.)

Ohio Compressor Co., Cincinnati, O.

Orange Machine & Mfg. Co., 280 S. Jefferson St., Orange, N. J. "Little Giant."

Paul—See Fort Wayne Engineering & Mfg. Co.

Potts Mfg. Co., Mechanicsburg, Pa.

Pro-Mo-Tor, 245 W. 55th St., New York, N. Y. "Herz Tandem," "Herz Minimax." (See page 513.)

Sargent Steam Meter Co., 2835-37 Armitage Ave., Chicago, Ill.

Smith, Irvin C., 855 S. Los Angeles St., Los Angeles, Cal.

Spicer Mfg. Co., Groton, Conn.

Star Brass Works, 319 N. Albany Ave., Chicago, Ill. "Binks."

Stroh & Dorman, Barberton, O.

Success—See Brown Beer Pump Co.

Sunderland Machinery Co., Omaha, Neb. "Fox." (See page 243.)

Swan Mfg. Co., Port Huron, Mich.

Ten Eyck—See Air Device Co.

Topping Bros., 122 Chambers St., New York, N. Y.

Trojan—See Comstock Mfg. Co.

Union Steam Pump Co., Battle Creek, Mich.

Union Engine & Mfg. Co., Butler, Pa. (See page 537.)

United Engine & Mfg. Co., Hanover, Pa. "Manley." (See page 239.)

U. S. Air Compressor Co., 6550 Carnegie Ave., Cleveland, O. (See page 539.)

United States Electrical Tool Co., Cincinnati, O. (See page 257.)

Universal Pure Air Pump Co., 1607-11 Prairie Ave., Chicago, Ill.

Warren Machine Products Co., Warren, Pa. (See page 575.)

Westinghouse Air Brake Co., Pittsburgh, Pa

Williams & Ackerman, 95 Liberty St., New York, N. Y. (Metropolitan Distributors for "Lectroflater" Pump." (See page 743.)

Williams Foundry & Machine Co., 100 Walnut St., Akron, O. "Akron-Williams.)" (See page 733.)

PUNCHES, Arch and Washer

Braunsdorf-Mueller Co., 205 Madison St., Elizabeth, N. J.

Kraeuter & Co., 571-85 18th Ave., Newark, N. J.

PUNCHES, Center, Prick and Drift

Acme Engineering & Mfg. Co., 9 S. Clinton St., Chicago, Ill.

Beall Bros., Fourth St., Alton, Ill.

Braunsdorf-Mueller Co., 205 Madison St., Elizabeth, N. J.

Brown & Sharpe Mfg. Co., Promenade St., Providence, R. I.

Buffum Tool Co., Louisiana, Mo. (See page 707.)

Carver Tool Works, Spring Valley, N. Y.

Cincinnati Tool Co., 1951 Waverly St., Norwood, O. "Hargrave."

Cronk & Carrier Mfg. Co., Second National Bank Bldg., Elmira, N. Y.

Deuse, J. S., Chester, Conn.

Easy Hold—See West Haven Mfg. Co.

Evansville Tool Works, Ninth Ave. & Maryland St., Evansville, Ind.

Fairmount Tool & Forging Co., 10585 Quincy Ave., Cleveland, O.

Goodell-Pratt Co., Greenfield, Mass. (See page 751.)

Hargrave—See Cincinnati Tool Co.

Kortick-Falls Mfg. Co., San Francisco, Cal.

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For water or oil circulation on automobile, marine or stationary engines. The perfect pumps for cooling gas engine cylinders.

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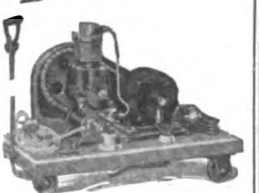

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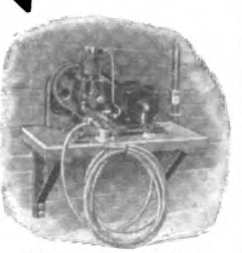

Electric Garage Pump

MAYO-SKINNER MFG. CO., 2115 Elston Ave., CHICAGO

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PUNCHES, Center, Prick and Drift (Continued)

Kraeuter & Co., 571-85 18th Ave., Newark, N. J.
Lowentraut Mfg. Co., P., 36-54 Brenner St., Newark, N. J.
Marcy Tool Works, Putnam, Conn.
Mayhew Co., H. H., Shelburne Falls, Mass.
Milwaukee Tool & Forge Co., 220 Becher St., Milwaukee, Wis.
O. K.—See West Haven Mfg. Co.
Peck, Stow & Wilcox Co., Southington, Conn. "Pexto."
Pexto—See Peck, Stow & Wilcox Co.
Red Devil—See Smith & Hemenway.
S. & I. Co., 55-57 Governor St., Springfield, Mass.
Smith & Hemenway, 130 Colt St., Irvington, N. J. "Red Devil."
Starrett Co., L. S., Athol, Mass.
Storts & Son, John, 210-12 Vine St., Philadelphia, Pa.
Syracuse Twist Drill Co., 936 Grape St., Syracuse, N. Y.
Tuck Mfg. Co., 74 Ames St., Brockton, Mass.
Union Tool Co., Orange, Mass.
West Haven Mfg. Co., 22 Elm St., (W. Haven) New Haven, Conn. "O. K," "Easy Hold."

PUNCHES, DEALERS IN—See Machinery, Dealers in

PUNCHES, DRIFT—See Punches, Center, Prick and Drift

PUNCHES, HAND—See Punches, Portable Hand

PUNCHES, Portable Hand

Armstrong-Blum Mfg. Co., Chicago, Ill "Marvel."
Buffalo Forge Co., 490 Broadway, Buffalo, N. Y.
Clough, R. M., Tolland, Conn.
Evansville Tool Works, Ninth Ave. & Maryland St., Evansville, Ind.
Excelsior Tool & Machine Co., 31st St., & Ridge Ave., East St. Louis, Ill. "Little Giant."
Huntington Machine & Foundry Co., Huntington, Ind.
Kidder Mfg. Co., J. F., Burlington, Vt.
Little Giant—See Excelsior Tool & Machine Co.
Little Giant Punch & Shear Co., Sparta, Ill.
Marvel—See Armstrong-Blum Mfg. Co.
Schatz Mfg. Co., 17 Fairview Ave., Poughkeepsie, N. Y.

PUNCHES, PRICK—See Punches, Center Prick and Drift

PUNCHES, WASHER—See Punches, Arch and Washer

PUNCTURE SEALING COMPOUNDS—See Compounds, Puncture Sealing

PURIFIERS, Acetylene Gas

(For insertion in pipe line between generator and lamps to remove impurities from the gas and prevent flickering of lights)

Tinkman Mfg. Co., Pierce City, Mo.
Western Brass Mfg. Works, Marshall Blvd., 21st St. & C. B. & Q. R. R., Chicago, Ill.

PUSH BUTTON SWITCHES—See Switches, Light

PUSH BUTTONS—See Buttons, Push

PUSH RODS—See Rods, Adjustable Valve Lift

PUSHES, Foot

(For ringing electric bells)

Rousseau, David, Ossining, N. Y.

PUTTEES, Aviators

Spalding & Bro., A. G., 126 Nassau St., New York, N. Y.

PUTTY RUBBER—See Compounds, Tire Repair

PUTTY, TIRE—See Compounds, Tire Repair

PYROMETERS

Advance—See Wilson-Maeulen Co.
American Steam Gauge & Valve Mfg. Co., 208-20 Camden St., Boston, Mass.
Bristol Co., Waterbury, Conn.
Brown Instrument Co., Wayne & Windrim Aves., Philadelphia, Pa.
Du Vivier, Ernest H., 30 Church St., New York, N. Y. "Importer."
Esterline Co., 228 E. South St., Indianapolis, Ind.
Hanovia Chemical & Mfg. Co., 233-39 N. J. Railroad Ave., Newark, N. J.
Hoskins Mfg. Co., 453-71 Lawton Ave., Detroit, Mich.
Le Chatelier—See Wilson-Maeulen Co.
Leeds & Northrup Co., 4921 Stenton Ave., Philadelphia, Pa.
Pyod—See Wilson-Maeulen Co.
Pyroscope—See Shore Instrument & Mfg. Co.
Queen-Gray Co., 616-18 Chestnut St., Philadelphia, Pa.
Schaeffer & Budenberg Mfg. Co., Berry & S. Fifth Sts., Brooklyn, N. Y.
Shore Instrument & Mfg. Co., 555-57 W. 22d St., New York, N. Y. "Pyroscope."
Stupakoff Laboratories, 410 Amberson Ave., Pittsburgh, Pa.
Tapalog—See Wilson-Maeulen Co.
Taylor Instrument Cos., 95 Ames St., Rochester, N. Y. "Tycos."
Thwing Instrument Co., 3339 Lancaster Ave. W., Philadelphia, Pa. "Twinko."
Twinko—See Thwing Instrument Co.
Tycos—See Taylor Instrument Cos.
Unipivot—See Wilson-Maeulen Co.
Wilson-Maeulen Co., Wales Ave. & E. 142d St., New York, N. Y. "Advance," "Le Chatelier," "Unipivot," "Pyod," "Tapalog."
Zaubitz, August, 97 Cliff St., New York, N. Y.

QUICK DETACHABLE RIMS—See Rims, Quick Detachable

QUICK DETACHABLE STEERING WHEEL RINGS, TRACTOR—See Rings, Tractor Quick Detachable Steering

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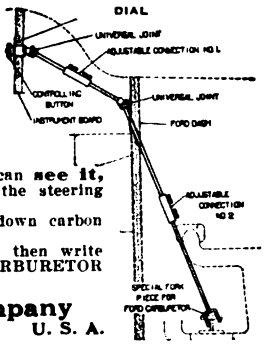
"Standard" Carburetor

CONTROL

FOR FORD CARS



Attaches to your instrument board where you can **see it, reach it** and **use it** without bending over the steering wheel or risking bodily injury.

The graduated dial helps save fuel and cuts down carbon deposit resulting from too rich a mixture.

If you would make your motor more efficient, then write for descriptive circulars of STANDARD CARBURETOR CONTROL.

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QUICK DETACHABLE WHEEL RIM EXTENSION PLATES, TRACTOR—See Plates, Tractor Quick Detachable

RACES, BALL—See Cups, Ball

RACKS, BODY HANDLING—See Trucks, Body Handling

RACKS, Hat

(Cord hat racks or holders for use in closed cars; see also Hangers, Hat)

Bridgeport Coach Lace Co., Bridgeport, Conn.
Columbia—See Hortsmann Co.
Hortsmann Co., Wm. H., Fifth & Cherry Sts., Philadelphia, Pa. "Columbia."
Schlegel Mfg. Co., College Ave. & N. Goodman St., Rochester, N. Y.

RACKS, LUGGAGE, FOR FORDS — See Racks and Luggage Carriers

RACKS, Metal Tool, Stock and Tire

Allsteelequip Co., 150 Stone Ave., Aurora, Ill
Berger Mfg. Co., Canton, O.
Carlsten-Williams Co., 2246-48 S. Michigan Ave., Chicago, Ill.
Clark Co., W. J., 190 Depot St., Salem, O.
Cleveland Wire Spring Co., Cleveland, O.
Cyclone Fence Co., Waukegan, Ill.
Darby & Sons Co., Edward, 235 Arch St., Philadelphia, Pa.
Dexter Metal Mfg. Co., Front & Arch Sts., Camden, N. J.
Dow Wire & Iron Works, Franklin, Buchanan & Pocahontas Sts., Louisville, Ky.
Durand-Steel Locker Co., 76 W. Monroe St., Chicago, Ill.
E. & S.—See Ellis-Smith Mfg. Co.
Ellis-Smith Mfg. Co., 216 Niagara St., Buffalo, N. Y. "E. & S."
Federal Steel Fixture Co., 4545 W. Homer St., Chicago, Ill.
Foster Bros. Mfg. Co., 811 Broad St., Utica, N. Y.
Fouts Co., C. C., Middletown, O.
Hetts Co., Detroit, Mich.
Jefferis Co., R. W., 11th & Linden Sts., Camden, N. J.
Lyon Metallic Mfg. Co., Aurora, Ill.
Manufacturing, Equipment & Engineering Co., 136 Federal St., Boston, Mass.
Multi-Unit—See National Scale Co.
National Scale Co., 9 Montgomery St., Chicopee Falls, Mass. "Multi-Unit."
New Britain Machine Co., 10 Bigelow St., New Britain, Conn. (See page 659.)
Ohio Mfg. Co., Painesville, O.
Shults & Co., H. H., 24 Commercial St., Gowanda, N. Y.
Terrell's Equipment Co., Victoria & Will Sts., Grand Rapids, Mich.
Van Dorn Iron Works Co., 2685 E. 79th St., Cleveland, O.
Wallace Supplies Mfg. Co., 420 Orleans St., Chicago, Ill.
Western Tool & Mfg. Co., Springfield, O.

RACKS, ROBE—See Rails, Robe

RACKS, STOCK—See Racks, Metal Tool

RACKS, TIRE—See Racks, Metal Tool

RACKS, TOOL—See Racks, Metal Tool

RACKS, Trunk

Durand-Ferry Mfg. Co., National Life Bldg., Chicago, Ill.
Highton & Sons Co., Wm., Nashua, N. H.
Gray, Jr., Niel, Oswego, N. Y.
Modine Radiator Co., Racine, Wis.
Reed Co., 801-05 High St., Palo Alto, Cal.
Reese Machine & Tool Works, S., 224-30 W. Main St., Plymouth, Pa.

RACKS, Trunk, and LUGGAGE CARRIERS, for Fords

Hastings Mfg. Co., Hastings, Mich.
Masco—See Milwaukee Auto Specialty Co.
Mazura Mfg. Co., 414 S. Sixth St., St. Louis, Mo.
Milwaukee Auto Specialty Co., 705-15 Chestnut St., Milwaukee, Wis. "Masco."
Moore, Leslie E., 1042 S. Olive St., Los Angeles, Cal.
National Mfg. Co., 1817 15th St., Denver, Colo.
Richards-Wilcox Mfg. Co., Third St. & C. B. & Q. R. R. Tracks, Aurora, Ill.
Western Brass Mfg. Works, Marshall Blvd., 21st St. & C., B. & Q. R. R., Chicago, Ill.

RADIAL DRILLS—See Drills, Radial

RADIATOR CAPS—See Caps, Brass Radiator; also Caps, Rubber Radiator

RADIATOR CAPS FOR FORDS—See Caps, Radiator

RADIATOR CLEANING COMPOUNDS—See Compounds, Radiator Cleaning

RADIATOR CONDENSERS—See Condensers, Radiator

RADIATOR CONNECTIONS—See Hose, Radiator

RADIATOR COVERS—See Covers, Radiator; also Covers or Shields, Automatic Radiator

RADIATOR CRADLES FOR FORDS—See Cradles, Radiator

RADIATOR DISCS—See Discs, Radiator

RADIATOR FANS—See Fans, Radiator

RADIATOR FENDERS — See Fenders or Guards, Truck Radiator

RADIATOR GUARDS — See Fenders or Guards, Truck Radiator

RADIATOR HEATERS—See Heaters, Radiator

RADIATOR HOODS FOR FORDS—See See Hoods, Radiator

RADIATOR HOSE—See Hose, Radiator

RADIATOR LACING—See Lacing, Fabric Radiator; also Leather, Rawhide Lace

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Established over 13 years.

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Rudco TRADE MARK

Reg. U. S. Pat. Office

ORIGINAL PATENTED

RUNNING BOARD MATS

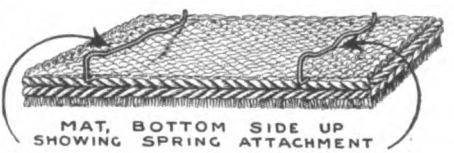
Price $2.50 Per Pair

You wouldn't think of entering your home on a wet day without first stopping to scrape the mud from your shoes. Stop also when entering your car.

You know the annoyance of dirty floor coverings—the result of tracking in mud and dust from the outside. You know that nothing has a more ruinous effect on a car than bringing in outside dirt. No doubt, you know the unpleasant task of removing unclean floor coverings after a day's driving.

Keep Your Car Clean

"Rudco" Mats keep the dirt on the outside. They are as essential on the running board of your car as a mat on your doorstep. They can be slipped on or off in a jiffy.



"Rudco" Mats Are Scientifically Constructed

They are woven by expert weavers from genuine Cocoa Fibre Yarn, imported from India. Built with the famous diamond back so the plugs cannot come out. All moisture quickly sinks to the bottom layers, leaving the top dry to thoroughly cleanse the shoes at all times. The tops are as low as it is possible to make them, which is insurance against accident. Attaching clamps are woven right into the mats.

Furnished in these sizes—8 x 14, 9 x 10, 9 x 14, 10 x 10, and 10 x 14 in.

Other sizes made up to order.

Manufacturers F. G. RUDDIMAN CO., Muskegon, Mich.
Exclusive Sales THE ZINKE COMPANY, Chicago, U.S.A.

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Indiana Head Lamps

These lamps have always been noted for their high quality, modern approved design and general serviceability. Standard finishes are all black and black and nickel.

No. 1216
12-in. Front. Props, 9¼ in.
Per Pair, **$18.50**
No. 1116
11-in. Front. Props, 8¼ in.
Per Pair, **$14.50**
No. 1016
10-in Front. Props 7 in.
Per Pair, **$12.50**

No. 10-G Gas
Close coupled, vibration proof. Genuine ground glass mirror and silvered front reflector. 10-in. diameter, 6-in. mirror. 8½ in. prop centers, 6½ in. deep.
Per Pair, **$10**

No. 1115
Bullet shape, hex. door. Silvered parabolic reflector, hand burnished. Diameter of front, 11½ in., prop centers, 8¼ in., depth, 6½ in.
Per Pair, **$11.50**

No. 916
New type for Ford cars. Flat door, plain glass, outside focusing device. Prop centers, 7 in. Can be furnished with bracket attached for 1915-16 Ford.
Per Pair, **$8.50**
Per Pair, with bkt., **$9.25**

No. 8-G Gas
Gas Lamp for Ford cars. diameter 8 in. Prop centers, 7 in. Also suitable for motorcycle head lamp. Can be had in all nickel.
Per Pair, **$7.00**

No. 1015
Designed especially for Ford cars. Round door, plain glass, distance between prop centers, 7 in. Diameter, 10 in.
Per Pair, **$10.25**
Per Pair, with bkt., **$11.00**

No. 617. Spotlight

For windshield or foredoor. Universal bracket permits light to be thrown in any direction. Diminishing mirror in handle. Can be used night and day. Self-contained switch. Just turn handle a trifle to right or left, focusing bulb. Diameter, 6½ in. Furnished with cord.
Each, **$5.00**

No. 717 DeLuxe Spotlight
The last word in spotlights Beautiful lamp made to match the most exclusive car design. Diameter 7½". Indiana exclusive switch in handle Press button to get in door. Special short universal bracket. Each.....**$7.00**

Manufacturers

Indiana Lamp Company
Connersville, Ind.

SALES DEPARTMENT

To the Jobber
The Zinke Company, No. 1323 Michigan Ave., Chicago, Ill.

To the Manufacturer
The American Distributing Co., No. 607 Kresge Building, Detroit, Mich.

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THE ZINKE COMPANY

Indiana Side and Tail Lamps

On account of their sturdy construction, they are suitable for use on trucks, tractors, and other heavy work, as well as on passenger cars. Standard finish is all black.

No. 26. Oil
Round type. 8½ in. high, 5 in. from back to front, diameter of glass, 3 in. Guaranteed to stay lighted.
Oil, Pair, **$4.50**
Combination. Pair, **$5.00**

No. 26-A. Oil
Same as No. 26, with extra large 5½ in. flange. Most sturdy for truck use.
Oil, Pair, **$5.50**
Combination. Pair, **$6.00**

No. 22. Oil.
Square type, prop riveted through heavy steel plate, making strongest possible construction. Will not rattle or leak.
Oil Pair, **$5.50**
Combination. Pair, **$6.00**

No. 615. Electric
Same design as bullet shape head lamps. Round door. Makes popular Electric Motorcycle Head Lamp. Diameter, 6 in. Depth, 4½ in.
Per Pair, **$8.00**

No. 30 Convex Flange Dash Lamp
White frosted rosette or semaphore glass. No visible screws. Rear door. Accessible.
Per Pair, **$4.00**

No. 415
Type for Ford cars. Plain glass. Regular brackets or to fit 1915-16 Ford. Diameter 4½ in.
Per Pair, **$6.00**

No. 24 Oil
Same type as No. 26.
Oil Each, **$2.50**
Combination Each, **$3.00**

No. 32
3⅝-in. red semaphore lens in rear, white in side.
Each, **$1.75**

No. 23 Oil
Square type like No. 22.
Oil, Each **$2.75**
Combination Each, **$3.50**

No. 32-L
Like No. 32 but with License Bracket.
Each, **$2.00**

Manufacturers

Indiana Lamp Company **Connersville, Ind.**

SALES DEPARTMENT

To the Jobber
The Zinke Company, No. 1323 Michigan Ave., Chicago, Ill.

To the Manufacturer
The American Distributing Co., No. 607 Kresge Building, Detroit, Mich.

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THE ZINKE COMPANY

Romort Specialties

Price $3 Each

Automatic Air Valve Style "A"

The Romort Automatic Air Valve, Style "A," is the most popular valve in use for heavy work. Solid bronze, practically indestructible. The new step-up stem fits any size tubing from one-quarter to one-half inch.

Price $1 Each

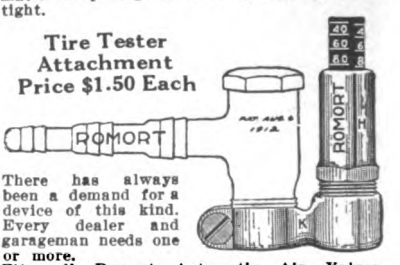
Automatic Air Valve Style "B"

The Romort Automatic Air Valve, Style "B," is a high grade air valve made to meet the popular demand for a light and inexpensive automatic air device. Solid bronze. Automatic in opening and closing, guaranteed air tight.

Rubber Washers For Romort Valves Price 25c per Carton

Romort Rubber Washers are constructed of a special Rubber Compound and will positively outwear any other make. They fit all pump connections. Easily slip on tire valves, will hold firm against high or low air pressure.

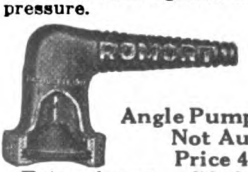
Tire Tester Attachment Price $1.50 Each



There has always been a demand for a device of this kind. Every dealer and garageman needs one or more.

Fits all Romort Automatic Air Valves, either Style "A" or Style "B," and provides a permanent holder for a pressure gauge. Simply slip the gauge into the holder and you have a tire tester and tire inflater combined in one, and the old trouble of losing gauge is forever over.

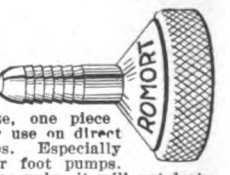
We furnish the attachment only in two types for Style "A" and Style "B" Valves.



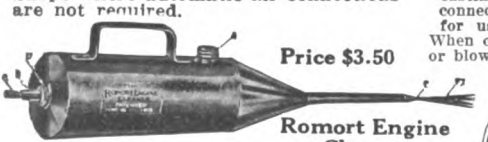
Angle Pump Connection Not Automatic Price 40c Each

Extra heavy solid bronze casting built to withstand constant service. Unequaled for Vulcanizing and Repair Shops where automatic air connections are not required.

Straight Pump Connection Price 20c Each



Made of solid bronze, one piece casting designed for use on direct connected air pumps. Especially for use on hand or foot pumps. When connected to tire valve it will not leak or blow off.



Price $3.50

Romort Engine Cleaner

The Romort Engine Cleaner is a guaranteed device that has no equal for cleaning dirt and grease from the machinery. Constructed on scientific lines, the air does not enter the tank but passes right through the air tube picking up the fluid at the extreme end of the cleaner, thereby eliminating all danger of explosion. Long spout enables operator to reach every corner.

Tank Connection

Price 80c Each

The Romort Tank Connection is intended to connect the air line to the outside hose. Entire connection may be unscrewed at night and taken in, thereby eliminating possibility of theft of hose and air valve. Made of heavy brass union with step-up stem to fit any size hose.

ROMORT GUARANTEE

All goods manufactured by the Romort Manufacturing Company must be perfect in material and workmanship. Any article found defective will be repaired or replaced at their Seattle or Chicago office free of all cost, except transportation charges, which must be prepaid.

Manufacturers

Romort Manufacturing Company Oakfield and Chicago

Exclusive Sales

The Zinke Company 1323 Michigan Ave., Chicago

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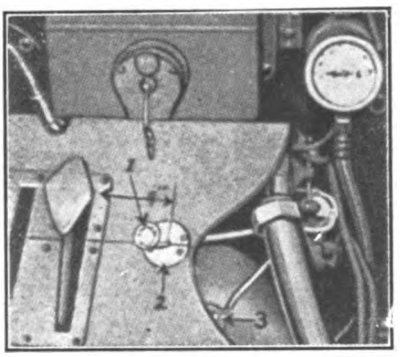
THE ZINKE COMPANY

Ewald Specialties

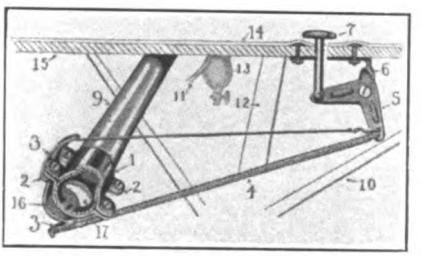
FOR FORD CARS



Ewald Foot Accelerator

The fact that over 48,000 of these accelerators have been sold proves the wonderful demand there exists for this device. Ford owners are demanding them more and more every day—because it does away with vexatious delays when starting, and thus leaves the driver's hands free to operate the steering wheel and makes the control of a Ford as perfect as the most expensive car.

List price 75 cents each. Price to dealers $3.75 per doz.



Ewald All Steel Cut-Out

Gives a more positive cut-out than any other on the market because it throws the exhaust direct into the air and not through another pipe or cast-tee. It offers no resistance on the exhaust when closed—and is impossible to break or wear out, as it is constructed of solid steel. It weighs about one-fourth as much as the cast iron cut-outs now in use and will not get out of order, as there are no chains or pulleys to bother with. It releases the strain on the engine caused by gases in the muffler and is a great aid in locating engine troubles, for it tells at once if the engine is missing fire.

PRICES

		Retail	Dealers
Ford Outfit	1½" Valve	80c	$4 a doz.
Dodge, Studebaker and Hupmobile	2" Valve	$1.25	6 a doz.
Maxwell	1⅜" Valve	1.25	6 a doz.
Buick	1¾" Valve	1.25	6 a doz.
Chevrolet	2⅛" Valve	1.25	6 a doz.

Ewald All Steel Pedal

This pedal can be used for many purposes. It is very simple yet strong, light and durable because it is made from a solid piece of steel. It is punched with 5 holes so as to give different lengths of stroke as may be required, and has a 3¼ inch throw.

List price 20 cents each. Price to dealers $1.50 per dozen.

Manufacturers

Rorport Manufacturing Company, Oakfield and Chicago

Exclusive Sales

The Zinke Company, 1323 Michigan Ave., Chicago, Ill.

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THE ZINKE COMPANY

MOTOR MICA GREASES

TRADE MARK

CUP GREASE

Motor Mica cup grease prevents hot bearings, cuts lubrication cost 35 to 50 per cent, saves wear and tear wherever used. It has been proven to be more efficient than graphite because MOTOR MICA Grease is antifriction.

Price, per 5-lb. pail.....$1.25
12 pails to the case.

TRANSMISSION GREASE

Motor Mica Transmission Grease is a grease of medium density which can be used in all transmissions and differentials except those designed for light oil lubrication. If the bearings are tightly fitted so the grease cannot leak from the case, it will last much longer than any other grease. The parts remain so cool that the grease does not waste away.

Price, per 5-lb. pail.....$1.25
12 pails to the case.

DIFFERENTIAL GREASE

Motor Mica Differential Grease overcomes the annoyance of leaky rear axles, where the lubricant works out on the brake bands and over the wheels.

Price, per 5-lb. pail.....$1.25
12 pails to the case.

MOTOR MICA LUBRICANT

in powder form is furnished so you can mix it yourself with cylinder oil or other lubricants. An ounce of MOTOR MICA is sufficient to treat a gallon of oil or a pound of grease. It is equally suitable for use in the heaviest machinery or the most delicate mechanism. It keeps motors and bearings cool, and can be used between spring leaves, eliminating all squeaks.

1 ounce can, each.....$ .10
½ pound can, each..... .60
1 pound can, each..... 1.00

MOTOR MICA TIRE POWDER

prevents inner tubes from sticking to tires and eliminates overheating. Will not stick, cake or harden. This is a real money-saver. Put up in convenient shaker tube attractively labeled.

Price, per package.....$0.15

Mfd. by MOTOR MICA Products Co.
TRADE MARK

THE ZINKE COMPANY, Sales Dept.

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THE ZINKE COMPANY

UTILITY Automotive PRODUCTS

4 MODELS

A MODEL FOR EVERY CAR

UTILITY
PROTECTED HEATER

For all cars. Nickeled protector. Length 29 in. Weight 14 lbs.

Price $20.00.

UTILITY
FRONT SEAT HEATER

For roadsters, driving compartments of la·ge cars and trucks. For rear installation on Maxwells and Chevrolets. Nickeled protector. Length 17 in. Weight 10¼ lbs. Price $12.50.

UTILITY, JR.
PROTECTED HEATER

For Fords and other small cars. Finished in black enamel. Length 17 in. Weight, 10¼ lbs.

Price $9.00.

UTILITY DE LUXE PROTECTED HEATER

For 8 cylinder cars. Nickeled protector. Length 29 in. Weight 14 lbs. Price $25.00. Regulated by foot adjuster.

When ordering give outside diameter of exhaust pipe ahead of muffler, or make, year and model of car. All models are furnished packed in heavy corrugated boxes ready for shipment.

UTILITY Tire Pumps

Standard equipped with UTILITY Safety-Gauge which automatic-a ly whistles and stops inflation at tire's proper pressure. Pump fits any convenient spark plug hole.

UTILITY Pump for all weights of cars and sizes of tires. Price $12.00. Handsomely bronzed. Furnished complete with safety-gauge, two spark plug hole adapters, and 12 ft. braided air hose, 1000 pound test. Shipping weight 5 lbs.

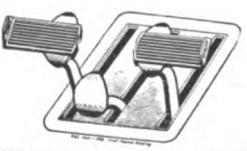
UTILITY, Jr., Pump for Fords and other small cars. Price $7.50. Nickeled finish. Complete with safety-gauge, two adapters and 10 ft. hose. Shipping weight 3 lbs.

UTILITY Disappearing Truck Body for Fords.

Quickly conve·ts the Ford roadster into a ½-ton truck. Only 4 bolts used to attach. Made of heavy gauge steel, finished in black baked enamel to match finish of car. Acetylene welded throughout. Rattle-proof. Price, complete, $38.50.

UTILITY Universal Wrench Set

Will fit automatically, any nut of any size or shape. No screws to manipulate, or parts to get out of order. All the advantages of expensive 16-piece socket wrench sets. Price, only $3.50.



UTILITY Pedals for Fords

Transform small smooth Ford clutch and brake pedals into standard size, comfortable pedals. Heavy rubber pad and side flange prevent slippage. Instantly attached. No holes to drill. Made of pressed steel, black enamel finished. Price, per set, $1.25.

UTILITY Universal Rim Wrench

Fits every nut on every demountable rim. Beautifully finished in nickel and black enamel. Fits into tool box. Absolutely rigid in action. Price $1.75.

Manufacturers

HILL PUMP VALVE CO., Archer Avenue and Canal St., Chicago

Sales Department

THE ZINKE CO., 1393 Michigan Ave., Chicago

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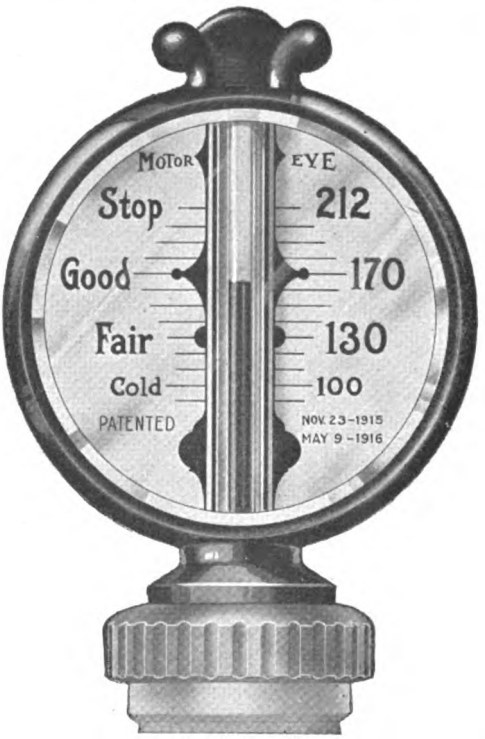
THE ZINKE COMPANY

Accurate Motor Temperature at Reasonable Cost



SEES ALL MOTOR EYE TELLS ALL Means Steady Indication

Recording instruments must be accurate to be of value.

By taking the temperature of the water as it leaves the motor, the MOTOR EYE assures accuracy. It shows each degree of change in motor temperature.

It warns before damage can be done by an overheated motor.

It Works In Water

MANUFACTURERS OF AUTOMOTIVE VEHICLES.

Investigate this. Test out the MOTOR EYE. They are now being used as factory equipment. Special prices on contracts.

Jobbers and Dealers

You can make money on this device. Their reasonable price interests your trade.

Write us today for full particulars.

Sole Owners and Mfrs.

Metalware Corporation, Chicago

Sales Department

The Zinke Co., Chicago

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NATIONAL
RADIATORS

AUTOMOBILES

—the ZIG-ZAG CORE is the secret of cooling efficiency and lends to artistic design.

TRUCKS

—the SPIRAL TUBING cooling sections are assembled for strength, stability and unusual strains.

TRACTORS

—this TYPE of CORE is designed after the most "up-to-date" engineering practice.

FORD ZIG-ZAG

—made for all models, including streamline hoods.

NATIONAL CAN COMPANY
Radiator Department
DETROIT MICHIGAN

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RADIATOR MONOGRAMS — See Monograms, Ornamental

RADIATOR ORNAMENTS—See Ornaments, Radiator; also Flags; also Holders, Flag; also Monograms, Ornamental

RADIATOR PANS FOR FORDS—See Pans, Radiator Splash

RADIATOR REPAIR CEMENT—See Cement, Radiator Repair

RADIATOR SEALING COMPOUNDS—See Cement, Radiator Repair

RADIATOR SHIELDS — See Covers or Shields, Radiator

RADIATOR SIGNS—See Monograms, Ornamental Metal

RADIATOR TEMPERATURE CONTROLLERS FOR FORDS — See Covers or Shields, Automatic Radiator

RADIATOR THERMOMETERS—See Meters, Heat Indicating

RADIATOR WATER LEVEL INDICATING METERS—See Meters, Radiator Water Level Indicating

RADIATORS, Aircraft Water Cooling

Ajax Auto & Aero Sheet Metal Works, 245 W. 55th St., New York, N. Y.

Auto Radiator Mfg. Co., 1712 S. Michigan Ave., Chicago, Ill. "Zig Zag."

Bush Mfg. Co., Hartford, Conn. (See page 573.)

English & Mersick Co., New Haven, Conn. (See page 573.)

Fedders Mfg. Co., Buffalo, N. Y. (See page 561.)

Flexo Mfg. Co., 1312-20 E. 12th St., Los Angeles, Cal.

G & O Mfg. Co., New Haven, Conn. (See page 575.)

Harrison Radiator Corp., Lockport, N. Y. (See page 575.)

Ideal Sheet Metal Works, 213 N. Morgan St., Chicago, Ill.

Livingston Radiator & Mfg. Co., 205 W. 75th St., New York, N. Y.

Lober Art Brass & Specialty Co., 126-28 11th St., Toledo, O.

McCord Mfg. Co., Detroit, Mich. (See pages 558 and 559.)

Martin-Rockwell Corp., 143d St. & Southern Blvd., New York, N. Y.

Motor Radiator Co., 1239 N. 12th St., Philadelphia, Pa.

Perfex Radiator Co., 642 Flett Ave., Racine, Wis.

Rome-Turney Radiator Co., Rome, N. Y. (See page 555.)

Zig Zag—See Auto Radiator Mfg. Co.

RADIATORS, DUMMY, FOR FORDS—See Hoods, Radiator

RADIATORS, Tractor Water Cooling

Auto Radiator Mfg. Co., 1712 S. Michigan Ave., Chicago, Ill. "Zig Zag."

Bremer Mfg. Co., Canal & Forquer Sts., Chicago, Ill. (See page 571.)

Bush Mfg. Co., Hartford, Conn. (See page 573.)

Chicago Mfg. Co., 1458-64 Michigan Ave., Chicago, Ill. (See page 741.)

English & Mersick Co., New Haven, Conn. (See page 573.)

Eureka Auto Parts Mfg. Co., 1915-17 Pine St., St. Louis, Mo.

Fedders Mfg. Co., Buffalo, N. Y. (See page 561.)

Flexo Mfg. Co., 1312-20 E. 12th St., Los Angeles, Cal.

G & O Mfg. Co., New Haven, Conn. (See page 575.)

Harrison Radiator Corp., Lockport, N. Y. (See page 575.)

Hooven Radiator Co., 417 S. Dearborn St., Chicago, Ill. "Spery." (See page 407.)

Ideal Sheet Metal Works, 213 N. Morgan St., Chicago, Ill.

Kells Mfg. Co., 521-25 W. 45th St., New York, N. Y. (See page 575.)

Livingston Radiator & Mfg. Co., 205 W. 75th St., New York, N. Y.

Lober Art Brass & Specialty Co., 126-28 11th St., Toledo, O.

Long Mfg. Co., Detroit, Mich. (See page 557.)

McCord Mfg. Co., Detroit, Mich. (See pages 558 and 559.)

Modine Mfg. Co., Sattley Bldg., Racine, Wis. "Spirex."

Murphy Co., P. J., 6-10 E. Hennepin Ave., Minneapolis, Minn.

Perfex Radiator Co., 642 Flett Ave., Racine, Wis.

Rome-Turney Radiator Co., Rome, N. Y. (See page 555.)

S-J—See Shotwell-Hobart-Johnson Co.

Shotwell-Hobart-Johnson Co., 712-22 Ontario Ave., N., Minneapolis, Minn. "S-J."

Spery—See Hooven Radiator Co.

Todd Mfg. Co., Minneapolis, Minn. (See page 571.)

Spirex—See Modine Mfg. Co.

Zig Zag—See Auto Radiator Mfg. Co.

RADIATORS, Water Cooling

A. Z. Co., 530 W. 56th St., New York, N. Y. (See page 563.)

American—See United States Cartridge Co.

Auto Radiator Mfg. Co., 1712 S. Michigan Ave., Chicago, Ill. "Flexo."

Bremer Mfg. Co., Canal & Forquer Sts., Chicago, Ill. (See page 571.)

Bush Mfg. Co., Hartford, Conn. (See page 573.)

C. A. S. Engineering Co., 790 Woodward Ave., Detroit, Mich. (Sole Distributors for Kuenz Radiator Co., Detroit, Mich.) (See page 312.)

California Trailer & Radiator Co., India & C Sts., San Diego, Cal.

Candler Radiator Co., 1084 E. Jefferson Ave., Detroit, Mich.

Chicago Mfg. Co., 1458-64 Michigan Ave., Chicago, Ill. (See page 741.)

El Arco Radiator Co., West End Ave. & 64th St., New York, N. Y.

English & Mersick Co., New Haven, Conn. (See page 573.)

Eureka Auto Parts Mfg. Co., 1915-17 Pine St., St. Louis, Mo.

Fedders Mfg. Co., Buffalo, N. Y. (See page 561.)

Flexo Mfg. Co., 1312-20 E. 12th St., Los Angeles, Cal.

Flexo—See Auto Radiator Mfg. Co.

G & O Mfg. Co., New Haven, Conn. (See page 575.)

Harrison Radiator Corp., Lockport, N. Y. (See page 575.)

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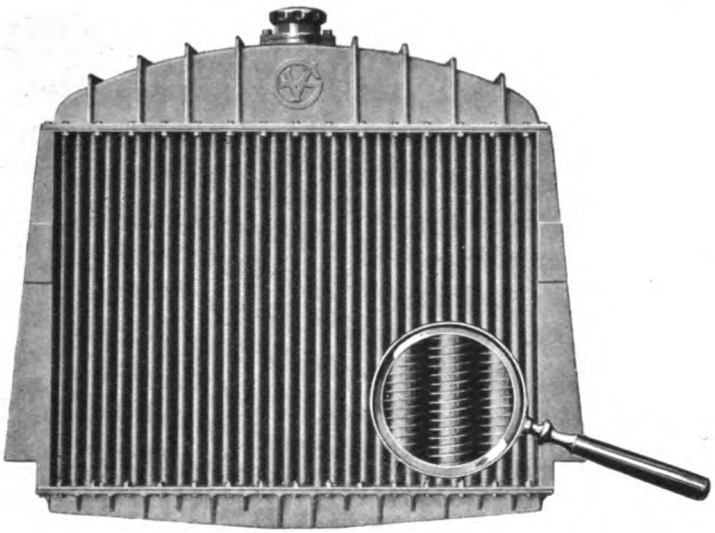
RADIATOR INSURANCE



SEAMLESS HELICAL TUBE

RADIATORS AND COOLING SECTIONS

are guaranteed to you for the life of the truck on which they are installed. Designed with extreme care, constructed of the best material, they are approved and used by the leading engineers of the industry.

All of the resources and knowledge of our engineering department are at your command.

WE ARE NOW EQUIPPED TO PRODUCE COMPLETE CAST CASE RADIATORS OR COOLING SECTIONS ONLY IF PREFERRED.

Send us your inquiries

Rome-Turney Radiator Company

Rome, New York

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RADIATORS, Water Cooling (Continued)

Hooven Radiator Co., 417 S. Dearborn St., Chicago, Ill. "Spery." (See page 407.)

Ideal Sheet Metal Works, 213 N. Morgan St., Chicago, Ill.

Jackson Auto Radiator Works, 625-31 W. Jackson Blvd., Chicago, Ill.

Jamestown Car Parts Mfg. Co., 100 Steele St., Jamestown, N. Y.

Kells Mfg. Co., W. J., 521-25 W. 45th St., New York, N. Y. (See page 575.)

Kuenz Radiator Co.—See C. A. S. Engineering Co.

Livingston Radiator & Mfg. Co., 205 W. 75th St., New York, N. Y.

Lober Art Brass & Specialty Co., 126-28 11th St., Toledo, O.

Long Mfg. Co., Detroit, Mich. (See page 557.)

McCord Mfg. Co., Detroit, Mich. (See pages 558 and 559.)

McDole Automobile Sheet Metal Works, 218-20 E. Water St., Kalamazoo, Mich. "Maco." (See page 285.)

Maco—See McDole Automobile Sheet Metal Works.

Martin Rockwell Corp., 143rd St. & Southern Blvd., New York, N. Y.

Modine Mfg. Co., Sattley Bldg., Racine, Wis. "Spirex."

National Can Co., Detroit, Mich. "Zig-Zag." (See page 553.)

Perfex Radiator Co., 642 Flett Ave., Racine, Wis.

Rome-Turney Radiator Co., Rome, N. Y. (See page 555.)

S-J.—See Shotwell-Hobart-Johnson Co.

Sheppard Mfg. Co., 1331 Jackson Blvd., Chicago, Ill.

Shotwell-Hobart-Johnson Co., 712-22 Ontario Ave., N., Minneapolis, Minn. "S-J."

Sparks-Withington Co., Jackson, Mich.

Spery—See Hooven Radiator Co.

Spirex—See Modine Mfg. Co.

Standard Radiator Co., Springville, N. Y.

Todd Mfg. Co., Minneapolis, Minn. (See page 571.)

United States Cartridge Co., Lowell, Mass. "American."

Wright Cooler & Hood Mfg. Co., 4868-70 N. Clark St., Chicago, Ill.

Zig-Zag—See National Can Co.

RADIATORS, Water Cooling, for Fords (Regular and V Type)

Auto Radiator Mfg. Co., 1712 S. Michigan Ave., Chicago, Ill. "Zig Zag."

Bulldog—See Livingston Radiator & Mfg. Co.

Candler Radiator Co., 1084 E. Jefferson Ave., Detroit, Mich.

Chicago Mfg. Co., 1458-64 Michigan Ave., Chicago, Ill. (See page 741.)

Corcoran Mfg. Co., 4634 Spring Grove Ave., Cincinnati, O. "Peerless."

Detroit Radiator & Specialty Co., 965 Woodward Ave., Detroit, Mich.

El Arco Radiator Co., West End Ave. & 64th St., New York, N. Y.

Eureka Auto Parts Mfg. Co., 1915-17 Pine St., St. Louis, Mo.

Fedders Mfg. Co., Buffalo, N. Y. (See page 561.)

G & O Mfg. Co., New Haven, Conn. (See page 575.)

Hooven Radiator Co., 417 S. Dearborn St., Chicago, Ill. "Spery." (See page 407.)

Ideal Sheet Metal Works, 213 N. Morgan St., Chicago, Ill.

Jackson Auto Radiator Works, 625-31 W. Jackson Blvd., Chicago, Ill.

Lawco—See Lawson Co.

Lawson Co., F. H., Dept. D, Cincinnati, O. "Lawco." (See page 663.)

Livingston Radiator & Mfg. Co., 205 W. 75th St., New York, N. Y. "Bulldog."

Lober Art Brass & Specialty Co., 126-28 11th St., Toledo, O.

National Can Co., Detroit, Mich. "Zig-Zag." (See page 553.)

Peerless—See Corcoran Mfg. Co.

Perfex Radiator Co., 642 Flett Ave., Racine, Wis.

Rome Turney Radiator Co., Rome, N. Y. (See page 555.)

S. J.—See Shotwell-Hobart-Johnson Co.

Shotwell-Hobart-Johnson Co., 712-22 Ontario Ave., Minneapolis, Minn.

Spery—See Hooven Radiator Co.

Superior Lamp Mfg. Co., 136 W. 52d St., New York, N. Y.

Todd Mfg. Co., Minneapolis, Minn. (See page 571.)

Waterbury Auto Radiator Co., 453 W. Main St., Waterbury, Conn.

Wright Cooler & Hood Mfg. Co., 4868-70 N. Clark St., Chicago, Ill.

Zig Zag—See Auto Radiator Mfg. Co.

Zig-Zag—See National Can Co.

RADIUS ROD SILENCERS FOR FORDS—See Anti-Rattlers, Radius Rod

RADIUS RODS FOR FORDS—See Rods, Radius

RAGS, WIPING—See Wipers

RAILS, COAT—See Rails, Robe or Coat

RAILS, FOOT—See Rests or Rails, Foot

RAILS, Robe or Coat

(Metal rails or leather or fabric straps for attaching to back of front seats to hold robes or coats)

Aetna Brass Mfg. Co., 1633 E. 55th St., Cleveland, O.

Allen Fire Department Supply Co., Providence, R. I.

American Brass Novelty Co., Grand Haven, Mich.

Amesbury Brass & Foundry Co., Amesbury, Mass.

Attwood Brass Works, Grand Rapids, Mich. (See page 531.)

Brace Leather Goods Co., 22 Wayne St., Pontiac, Mich.

Campbell Electric Co., Willow St., Lynn, Mass.

Carter Co., George R., 1600-20 Kentucky Ave., Connersville, Ind.

Central Brass & Fixture Co., Dept. A., Springfield, O. (See page 137.)

Cowles & Co., C., New Haven, Conn. (See page 339.)

Cox Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y.

Douglas & Lomason Co., 642 Lincoln Ave., Detroit, Mich.

E G Mfg. Co., 250 W. 54th St., New York, N. Y. (Dealers.) (See page 215.)

Eastern Production Co., 137 Leib St., Detroit, Mich. (See page 345.)

English & Mersick Co., New Haven, Conn. (See page 573.)

Enterprise Brass & Plating Co., Sixth & Raymiller Sts., Cincinnati, O.

Ford-Clark Co., 3125 Perkins Ave., Cleveland, O.

Gemeo Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. (See page 135.)

Highton & Sons Co., Wm. Nashua, N. H.

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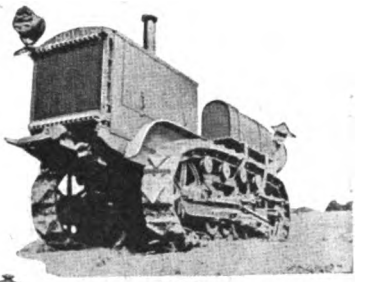
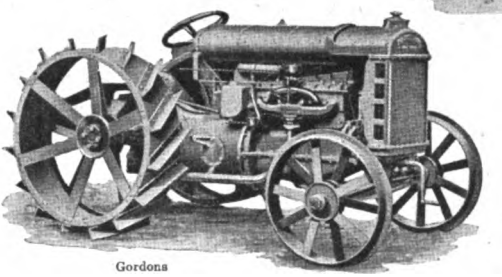
War Tank

Velie


Holt Tractor


Gordons

Duplex

Armleder

Hall

Acme

LONG COOLING SYSTEMS

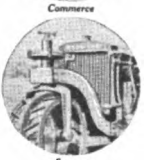
Atterbury

Graham-Bernstein

Peerless

Commerce

Indiana


Samson

SCIENTIFIC RADIATION

The development of Long Cooling Systems to their present state of perfection is the result of scientific inquiry into service conditions that they are required to meet as well as to the exact application of all the principles governing heat radiation. Anybody can build a radiator of more or less standard design, but only an organization whose every consideration is based upon engineering principles can achieve the success and establish the international reputation which is accredited to Long Cooling Systems.

We point with pride to our uninterrupted and continuous success for seventeen years. The last five years have seen the greatest development.

The various departments, each complete and efficient in itself, make a competent organization that permits the highest quality of work, immense quantity production, and guarantees service results to meet the requirements of the largest and most exacting manufacturers.

ENGINEERING CO-OPERATION

Each Long Cooling System is specially designed to order for the particular type of vehicle with which it is to serve.. Each step in creating the design is taken in co-operation between the Engineering Departments of the manufacturer and our factory. Proper design insures proper construction, and by reason of this co-operation we attain maximum efficiency and minimum cost.

No Engine Can Be More Efficient Than Its Cooling System

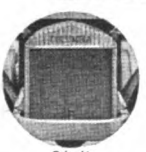
Long Cooling Systems are made in more than sixty different designs—adapted to every type of motor vehicle.

The recognized Standard for Motor Cars, Motor Trucks & Tractors

LONG Mfg. Co., Detroit, Mich.

Pioneer Makers of Cooling Systems for Gasoline Engines

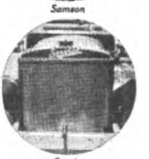
Standard


Columbia

International

Oneida

Union


Service

AS CONSTANT AS NIAGARA

Oakland

Denby

Federal

Four Wheel Drive

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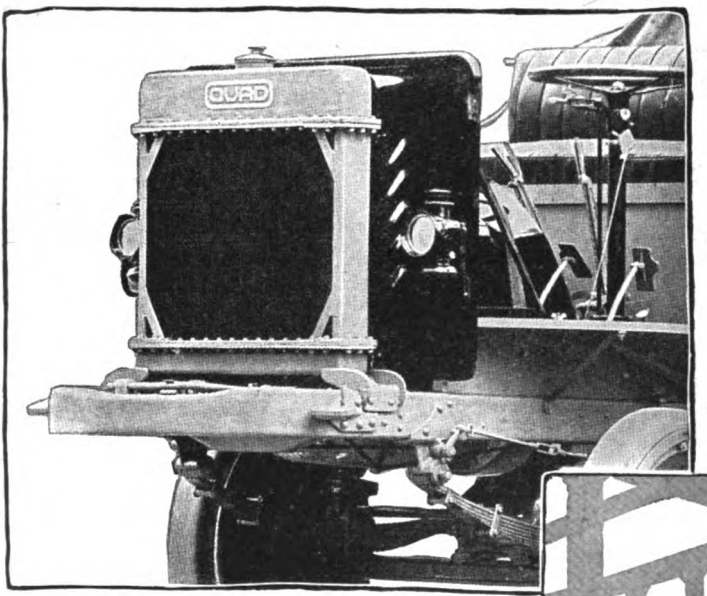

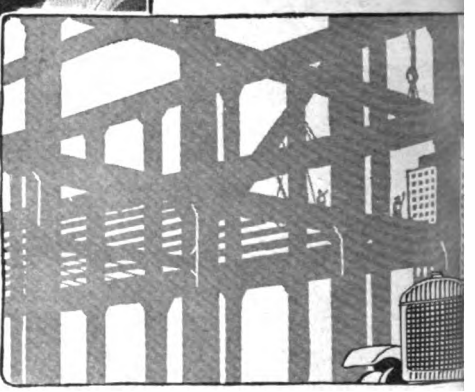

The construction of the continuous fin tubular type radiator (one of the types we make) may be compared with that of a modern sky-scraper.

McCord Radiators

For Automobiles, Trucks, Tractors, Airplanes, Stationary Engines

Manufacturing radiators for so long—ever since the inception of the motor car industry—has given us a wealth of experience.

We manufacture every type of radiator used in automobiles, trucks, tractors, airplanes and stationary engines.

Our engineering department is available to help solve your cooling problems. Consultation with our engineers will insure greatest cooling efficiency by the adoption of the proper type of radiator. Your correspondence is solicited.

McCord Manufacturing Co., Inc.

DETROIT, MICHIGAN

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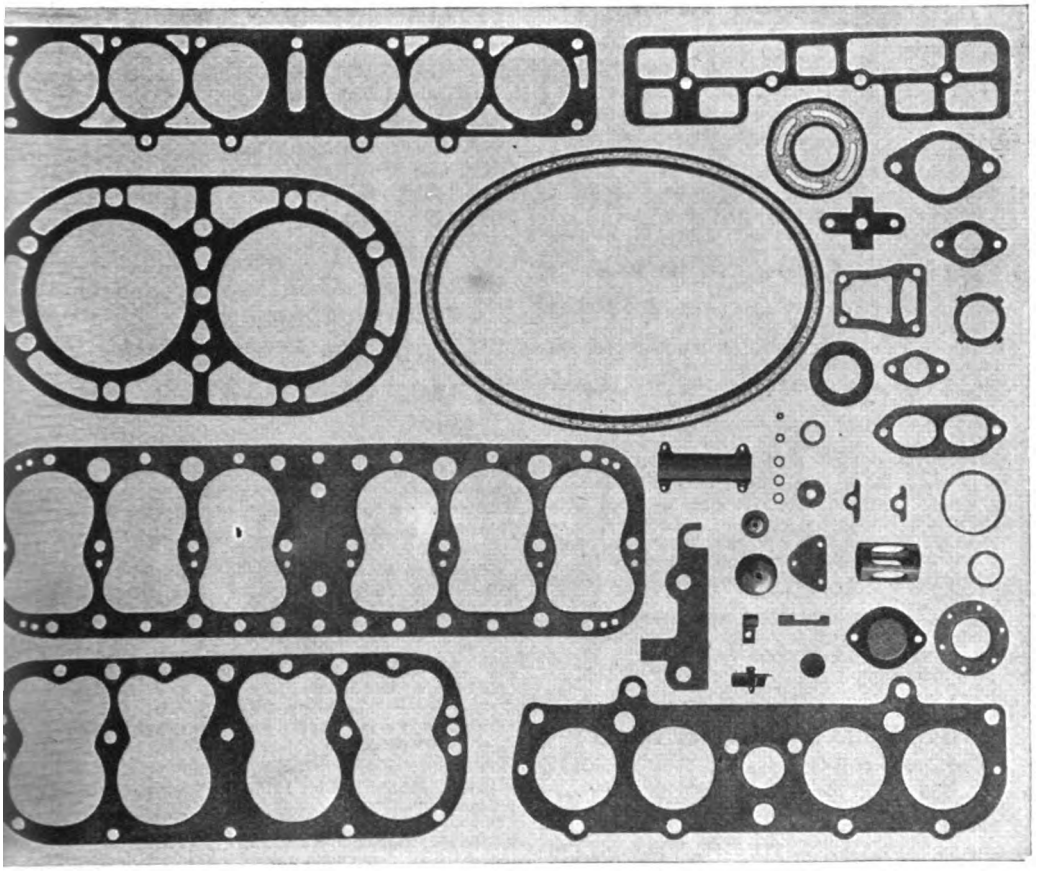

McCord Gaskets

(Copper-Asbestos)

Shims and Metal Stampings

There are many reasons for using McCord Gaskets. Time and experience have proved the superiority of the copper-asbestos construction—the greatest resistance to heat, pressure and wear. They are standard for all gasoline motor flanges. Quick shipments are made (large stock on hand at all times). Manufacturers, dealers, garages and users will find our literature interesting.

GASKET REPRESENTATIVES

NEW YORK: Joseph Holle, 1926 Broadway, Telephone, Columbus 6609
CHICAGO: H. A. McCord, 1301 So. Michigan Ave., Telephone, Calumet 7356

McCord Manufacturing Co., Inc.

DETROIT, MICHIGAN

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RAILS, Robe or Coat (Continued)

Hoover Co., W. H., New Berlin, O.
Imperial Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill. (See page 733.)
Jonah & George, Merrimac, Mass.
Keeler Brass Co., 261-71 Godfrey Ave., Grand Rapids, Mich.
Lamb Mfg. Co., Winsted, Conn.
Monarch Carriage Goods Co., 2838-44 Spring Grove Ave., Cincinnati, O.
Murdock, Jr. Co., Jas., 116 Opera Pl., Cincinnati, O.
O'Brien Mfg. Co., Joseph F., 391 Broadway, New York, N. Y.
Schlegel Mfg. Co., College Ave. & N. Goodman St., Rochester, N. Y.
Smith & Co., Jos. N., E. Grand Blvd. & Dubois St., Detroit, Mich.
Star Brass Works, 2623 McGee Ave., Kansas City, Mo.
Sterling—See Auto Accessories Mfg. Co.
Sutherland Co., F. L., 139 Beaubien St., Detroit, Mich. (See page 523.)
Wakefield Sales Co., Trempealeau, Wis.
Warner Electric Co., Walnut & 20th Sts., Muncie, Ind.
Western Brass Mfg. Works, Marshall Blvd., 21st St. & C. B. & Q. R. R., Chicago, Ill.
White Mfg. Co., 155 Cannon St., Bridgeport, Conn.
Whitehouse-LeCompte Mfg. Co., 42-54 Elm St., Newark, N. J.
Woodruff & Sons Co., Walter W. Mount Carmel, Conn.

RAILS, Robe or Coat, for Fords

(Metal rails or leather or fabric straps for attaching to back of front seats to hold robes or coats)

Attwood Brass Works, Grand Rapids, Mich. (See page 531.)
Edelmann & Co., E., 341-63 E. Ohio St., Chicago, Ill.
Eureka Parts Co., 328 Central Ave., Dunkirk, N. Y.
Ford-Clark Co., 3125 Perkins Ave., Cleveland, O.
Gahm & McCormick Co., 802 E. Main St., Streator, Ill.
Gemco Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. (See page 135.)
Humboldt Machine & Stamping Co., 81-85 Tenth St., Long Island City, N. Y.
Ideal Brass Works, 560 N. Elder Ave., Indianapolis, Ind.
Monarch Carriage Goods Co., 2838-44 Spring Grove Ave., Cincinnati, O.
Starr Bros., East Hampton, Conn.
Wakefield Sales Co., Trempeleau, Wis.
Western Brass Mfg. Works, Marshall Blvd., 21st St. & C. B. & Q. R. R., Chicago, Ill.

RAIN COATS—See Clothing, Motorists'

RAIN SHIELDS—See Visors, Wind Shield and Rain Shield

RAISING SKIDS—See Skids, Car Raising

RASPS AND FILES—See Files and Rasps

RATCHET DRILLS—See Drills, Ratchet

RATCHET PEDALS—See Pedals, Ratchet

RAWHIDE GEARS—See Gears, Rawhide and Fibre

RAWHIDE PINIONS—See Gears and Pinions, Rawhide

REAMER GRINDERS — See Grinders, Reamer

REAMERS, ADJUSTABLE—See Reamers, Standard

REAMERS, BEARING, FOR FORDS—See Reamers, Main Bearing

REAMERS, CONNECTING ROD, FOR FORDS—See Reamers, Main Bearing

REAMERS, GUIDE—See Reamers, Valve Stem Guide

REAMERS, Main Bearing and Connecting Rod, for Fords

Dyer Co., G. H., Cambridge, Mass. (See page 505.)

REAMERS, Standard and Adjustable

Acme—See Schellenbach-Hunt Tool Co.
Adamantine—See American Tap & Die Co.
American Tap & Die Co., Greenfield, Mass. "Adamantine." (See page 685.)
Billings & Spencer Co., Laurel & Park Sts., Hartford, Conn.
Brubaker & Bros., W. L., Millersburg, Pa.
Cleveland Twist Drill Co., E. 49th St. & Lakeside Ave., Cleveland, O. "Paradox," "Peerless."
Clough, R. M., Tolland, Conn.
Critchley—See Cutter & Wood Supply Co.
Cutter & Wood Supply Co., Boston, Mass. "Critchley." (See page 669.)
Detroit Twist Drill Co., Detroit, Mich. (See page 239.)
Diamond—See Whitman & Barnes Mfg. Co.
Gisholt Machine Co., 1315 E. Washington Ave., Madison, Wis.
Greenfield Tap & Die Corp., Greenfield, Mass. "Hercules." (See page 687.)
Hercules—See Greenfield Tap & Die Corp.
Ideal—See McCrosky Reamer Co.
Illinois Tool Works, Chicago, Ill.
Kelly Reamer Co., Cleveland, O.
McCrosky Reamer Co., S. Main St., Meadville, Pa. "Ideal."
Martell—See Taft-Peirce.
Morse Twist Drill & Machine Co., New Bedford, Mass.
National Twist Drill & Tool Co., Brush St., nr. E. Grand Blvd., Detroit, Mich.
Ohio Reamer Co., 5337 St. Clair Ave., Cleveland, O.
One Lock Reamer Co., New Haven, Conn.
Paradox—See Cleveland Twist Drill Co.
Peerless—See Cleveland Twist Drill Co.
Perelstrous & Storms Tool Corp., 42 Broadway, New York, N. Y. (See page 643.)
Pratt & Whitney Co., 111 Broadway, New York, N. Y. (See page 73.)
Reliance Steel & Tool Co., 24-26 Murray St., New York, N. Y. (See page 275.)
Rich Tool Co., Railway Exchange, Chicago, Ill.
Rogers Works, John M., ft. Monmouth St., Gloucester City, N. J.
Schellenbach-Hunt Tool Co., 120 Opera Pl., Cincinnati, O. "Acme."
Screw Machine Products Corp., 1012 Eddy St., Providence, R. I.
Standard Tool Co., 6900-34 Central Ave., Cleveland, O.
Stapf & Co., John R., Dunkirk, N. Y.
Taft-Peirce, Woonsocket, R. I. "Martell." (See page 595.)
Whitman & Barnes Mfg. Co., E. Exchange St., Akron, O. "Diamond."

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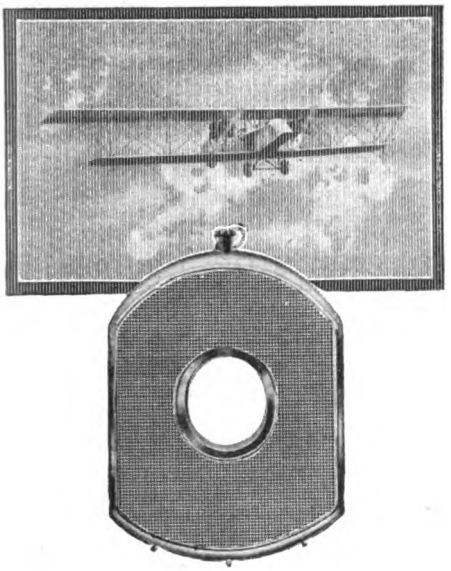
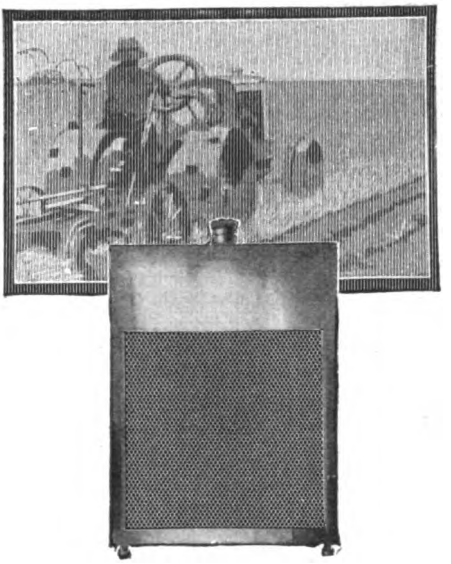




FEDDERS
RADIATORS

SERVING AMERICA ON ALL FRONTS

On the farms, in the industrial centers and on the battlefronts of Europe, Fedders Radiators are everywhere—and doing their bit.

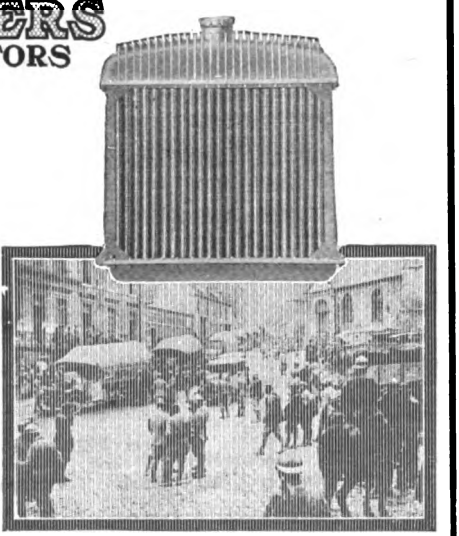
Because their fundamental principle of design is the most efficient of all, Fedders Radiators alone are easily adaptable to service on any type of engine-driven vehicle—Tractors, Trucks, Passenger Cars or Aeroplanes.

That Fedders serves best is proven by the fact that most of the best vehicles are Fedders-equipped.

Let Fedders help solve your radiator problems.

FEDDERS MFG. CO., Inc. **BUFFALO, N. Y.**

FEDDERS
RADIATORS



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REAMERS, Transmission Bushing, for Fords

Wilson, K. R., 10-16 Lock St., Buffalo, N. Y.

REAMERS, Valve Stem Guide

Healy Tool & Appliance Co., 299 Washington St., Buffalo, N. Y.

REAMERS and JIGS, Cylinder, for Fords

Alvord Reamer Co., Millersburg, Pa.
Dyer Co., G. H., Cambridge, Mass. (See page 505.)

REAR AXLE BEARINGS FOR FORDS—See Bearings, Auxiliary Rear Axle

REAR AXLE GREASE RETAINERS FOR FORDS—See Retainers, Rear Axle Grease

REAR AXLE REPAIR STANDS FOR FORDS—See Stands, Rear Axle Repair

REAR AXLE SHAFTS—See Shafts, Rear Axle

REAR AXLE SPINDLES FOR FORDS—See Spindles, Emergency Rear Axle

REAR AXLE TRUSS RODS FOR FORDS—See Rods, Rear Axle Truss

REAR AXLES FOR FORDS—See Axles, Worm Drive, Rear

REAR CARS—See Cars, Motorcycle Side and Rear

REAR LIGHT INDICATORS—See Indicators, Tail Light

REAR STARTERS, MOTOR BOAT—See Starters, Motor Boat, Rear Engine

REBUILT TIRES—See Tires, Rebuilt

REBORING MACHINES—See Machines, Portable Cylinder Reboring and Regrinding

REBORING TOOLS FOR FORDS—See Tools, Cylinder Reboring

REBOUND STRAPS—See Straps, Rebound

RECHARGERS, MAGNET—See Chargers, Magneto Magnet

RECORDERS, TIME—See Clocks, Watchman's

RECORDERS, Vehicle Movement

(For recording time vehicle is used)

American Taximeter Co., 16 W. 61st St., New York, N. Y. "Recordograf."
Brown Spring Oiler Co., 6911 Euclid Ave., Cleveland, O. "Traflog."
Hoggson & Co., S. H., Thames Bldg., New York, N. Y. "Joyometer."
Jones Speedometer Co., Bush Terminal, Brooklyn, N. Y.
Joyometer—See Hoggson & Co.
Maco—See Motors Appliance Co.
Motors Appliance Co., East Moline, Ill. "Maco." (See page 781.)
Recordograf—See American Taximeter Co.
Service Recorder Co., 2344 E. 105th St., Cleveland, O. "Servis."
Servis—See Service Recorder Co.
Traflog—See Brown Spring Oiler Co.

RECORDING BAROGRAPHS—See Barographs, Recording

RECORDING CLOCKS—See Clocks, Time Recording and Watchman's

RECORDING METERS FOR FORDS—See Meters, Distance

RECTIFIERS, Alternating Current

(For transforming alternating current to direct current for storage battery charging)

American Battery Co., 1132-34 Fulton St., Chicago, Ill. "Amrec," "Autrec."
Amrec—See American Battery Co.
Autrec—See American Battery Co.
Blitzen—See Clapp-Eastham Co.
Clapp-Eastham Co., 139 Main St., Cambridge, Mass. "Blitzen."
Economy—See Electric Economy Co.
Electric Controller & Mfg. Co., Cleveland, O.
Electric Converter Co., Toledo, O. "Little Giant."
Electric Economy Co., Hyde Park, Mass. "Economy."
Electric Products Co., Cleveland, O. "Wotton."
Electric Storage Battery Mfg. Co., 602 Plum St., Cincinnati, O.
Ellington Electric Co., 128 S. Fourth St., Quincy, Ill.
F. F.—See France Mfg. Co.
Fore Electric Mfg. Co., 5643 Easton Ave., St Louis, Mo.
France Mfg. Co., Cleveland, O. "F. F." (See page 683.)
General Electric Co., Schenectady, N. Y. "Tungar." (See pages 564 and 565.)
Hertner Electric & Mfg. Co., 1905 W. 112th St., Cleveland, O.
Hickley, Thomas, Belmar, N. J.
Little Giant—See Electric Converter Co.
Mohawk Electric Mfg. Co., 45 Lawrence St., Newark, N. J.
Murphy Electricity Rectifier Co., 187 N. Water St., Rochester, N. Y.
Rectifier Co. of America, Rand-McNally Bldg., Chicago, Ill.
St. Louis Electrical Works, 4057 Forest Park Blvd., St. Louis, Mo. (See page 269.)
Sirch Electrical & Testing Laboratories, 126 W. Third St., Los Angeles, Cal.
Stahl Rectifier Co., 1401 W. Jackson Blvd. Chicago, Ill.
Standard Metal Mfg. Co., 237 Chestnut St., Newark, N. J.
Tungar—See General Electric Co.
United Electric Apparatus Co., 1529 Columbus Ave., Boston, Mass.
Wagner Electric Mfg. Co., 6400 Plymouth Ave., St. Louis, Mo.
Westinghouse Electric & Mfg. Co. (E. Liberty), Pittsburgh, Pa.
Wotton—See Electric Products Co.

REDUCING VALVES OR REGULATORS—See Regulators, Acetylene Pressure

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The Attainment of
BEAUTY *and* EFFICIENCY
in Radiator Construction

—has been made possible with the advent of the A-Z "Hydra Tube" radiator, thus combining the beautiful in design with efficiency of operation. For this reason the better class of cars are adopting this new type of radiator.

We solicit the patronage of car builders whose vision carries them beyond the commonplace. It is to them that the A-Z "Hydra-Tube" idea will appeal as a great advance in radiator construction.

Being one of the oldest manufacturers of radiators in America, it is only a natural evolution of progress that we should produce the newest idea in motor-cooling systems.

The A. Z. Co.
530 West 56th Street
New York

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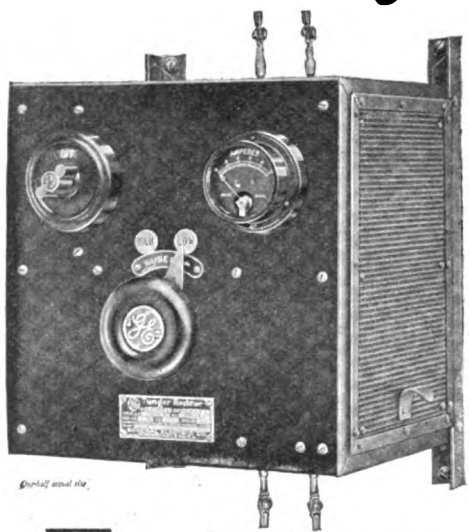
A Ready Reference



Tungar
RECTIFIER

To determine the cost
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ALABAMA
Matthews Electric Supply Co., Birmingham.
ARKANSAS
Battery Service Co., Little Rock.
CALIFORNIA
Appeal Mfg. & Jobbing Co., Los Angeles.
Chanslor & Lyon Co., Fresno, Los Angeles, Oakland, San Francisco.
Featherstone Co., E. A., Los Angeles.
McCoy Motor Supply Co., Los Angeles, San Francisco.
Pacific States Electric Co., Los Angeles, San Francisco, Oakland.
COLORADO
The Hendrie & Bolthoff Mfg. & Supply Co., Denver.
CONNECTICUT
New England Engineering Co., Waterbury.
DISTRICT OF COLUMBIA
National Electric Supply Co., Washington.
Rubel & Co., Charles, Washington.
FLORIDA
Florida Electric Supply Co., Jacksonville.
GEORGIA
Carter Electric Co., Atlanta.
ILLINOIS
Beckley-Ralston Co., Chicago.
Central Electric Co., Chicago.
Motor Car Supply Co., Chicago.
National Elec. & Auto Supply Co., Peoria.
INDIANA
Gibson Co., The, Indianapolis.
Indianapolis Elec. Supply Co., Indianapolis.
Kaough Co., R. M., Fort Wayne.
IOWA
Herring Motor Co., Des Moines.
Marshall Oil Co., Marshalltown.
Terry Co., J. B., Cedar Rapids.
Mid-West Electric Co., Des Moines.
KENTUCKY
Belknap Hardware & Mfg. Co., Inc., Louisville.
Cowan & Co., Andrew, Louisville.
LOUISIANA
Woodward-Wight & Co., Ltd., New Orleans.
MARYLAND
Southern Electric Co., Baltimore.
MASSACHUSETTS
American Motor Equipment Co., Boston.
Boice Motor Equipment Co., Boston.
Boice-Perrine Co., Boston.
Cutter & Wood Supply Co., Boston.
Lewis Electrical Supply Co., Boston.
Motor Car Equipment Co., Boston.
Pettingill-Andrews Co., Boston.
Post & Lester Co., Boston.
United States Rubber Co., Boston.
Wetmore-Savage Co., Boston.
Springfield Motor Spec. Co., Springfield.
Tarbell-Waters Co., Springfield.
Motor Tire Service Co., Worcester.
MICHIGAN
Cummings Brothers, Flint.
Teal Co., Frank C., Detroit
MINNESOTA
Nichols, Deal & Gregg, St. Paul.
Northwestern Elec. Equip. Co., St. Paul and Duluth.
Peerless Electric Co., Minneapolis.
Western Motor Supply Co., Minneapolis.
Williams Hardware Co., Minneapolis.
MISSOURI
B-R Electric Co., The, Kansas City.
Wesco Supply Co., St. Louis.

Western Electric Company in all principal cities

General Elec
Schenectady

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for Tungar Owners

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write to the General Elec-
-269.

COST OF CHARGE

No. of 3-Cell Batteries	Average A.C. Watts per Hour	Average A.C. Watts per Battery	Cost of Current per Hour per Battery at 5c Kw.-hr.
1	145	145	$.0073
2	187	94	.0047
3	238	79	.0040
4	290	72	.0037
5	333	66	.0033
6	376	63	.0032
7	426	61	.0031
8	473	59	.0030
9	518	58	.0029
10	560	56	.0028

s can be obtained from the Distributors:

MONTANA
Northwestern Auto Supply Co., Billings.
NEBRASKA
Mid-West Electric Co., Omaha.
NEW JERSEY
Motor Car Equipment Co., Newark.
Tri-City Electric Co., Inc., Newark.
NEW YORK
Havens Electric Co., Inc., Albany.
Mohawk Electrical Supply Co., Syracuse.
Motor Car Equipment Co., New York.
Picard & Co., A. J., New York.
Rober son-Cataract Electric Co., Buffalo.
Sibley-Pitman Electric Corp., New York.
Wheeler-Green Electrical Supply Co., Rochester.
OHIO
Correll Electric Co., The, Columbus.
Dine-DeWees Co., The, Canton.
Erner & Hopkins Co., The, Columbus.
Hall Electric Co., The Wm., Dayton.
Lawrence Electric Co., The F. D., Cincinnati.
Nagel Electric Co., The W. G., Toledo.
Republic Electric Co., The, Cleveland.
Roberts-Toledo Co., The, Toledo.
Silva Co., The E. H., Cincinnati.
Toledo Rubber Co., The, Toledo.
United Electric Supply Co., The, Columbus.
OKLAHOMA
Electric Vehicle & Battery Co., Tulsa.
Russell Hardware Co., McAlester.
Sharp Auto Supply Co., Oklahoma City.
OREGON
Chanslor & Lyon Co., Portland.
Pacific States Electric Co., Portland.
PENNSYLVANIA
General Auto Supply Co., Lancaster.
Kauffman Electric Co., Bloomsburg.
McCullough & Son, J. H., Philadelphia.
Mo or Parts Co., Philadelphia.
Noek Co., Geo. W., Philadelphia.
Philadelphia Electric Company Supply Dept., Philadelphia.
Scranton Electric Construction Co., Scranton.
Union Electric Co., Pittsburgh.
Woodwell Co., Joseph, Pittsburgh.
RHODE ISLAND
Providence Auto Equipment Co., Providence.
SOUTH CAROLINA
Alderman, Jr., D. W., Florence.
Perry-Mann Electric Co., Inc., Columbia.
SOUTH DAKOTA
Brownell Co., H. F., Sioux Falls.
TENNESSEE
Electric Supply Co., Memphis.
Hirsig Auto Supply Co., Nashville.
James Supply Co., Chattanooga.
Motor Service Co., Nashville.
TEXAS
Battery Equipment & Starter Corp., Houston.
Callahan, S. X., San Antonio.
Fisk Co., The, San Antonio and Dallas.
Spencer-Carroll Co., Waco.
Tire Co., Walter, Austin.
UTAH
Capital Electric Co., Salt Lake City.
WASHINGTON
Chanslor & Lyon Co., Seattle, Tacoma, Spokane.
Pacific States Electric Co., Seattle, Spokane.
WEST VIRGINIA
Dils & Son Co., H. P., Parkersburg.

tric Company
. New York

35A-22

REEDS, Horn

Riley-Klotz Mfg. Co., 17 Mulberry St., Newark, N. J.

Standard Metal Mfg. Co., 237 Chestnut St., Newark, N. J.

Warnola Mfg. Co., 73 Wooster St., New York, N. Y.

REELS, Automatic Extension

Cincinnati Specialty Mfg. Co., 1911 Powers St., W. Cincinnati, O. (See page 671.)

REFACERS, VALVE—See Tools, Valve Reseating

REFLECTORS, GAGE GLASS — See Mirrors, Water Gage

REFLECTORS, Headlight, for Fords

(Parabolic Reflectors for electric lights)

C-S—See Culver-Stearns Mfg. Co.

Columbus Auto Brass Co., Columbus, O. (See page 395.)

Culver-Stearns Mfg. Co., Detroit, Mich. "C-S." (See page 381.)

Evergood—See Grossman Mfg. Corp.

Faw, J. H., 37 Warren St., New York, N. Y. (Eastern and Southern Distributor for "C-S." Reflectors.) (See page 387.)

Fitzgerald Mfg. Co., Torrington, Conn. (See page 309.)

Grossman Mfg. Corp., Emil, Bush Terminal Bldg. No. 20, Brooklyn, N. Y. "Evergood."

Rosco—See Rosen & Co.

Rosen & Co., A. W., 610-14 Broadway, New York, N. Y. "Rosco."

Vesta Accumulator Co., 2100 Indiana Ave., Chicago, Ill.

REFLECTORS, Mirror Lamp

(For special dimming reflectors—See Dimmers)

Bache & Co., Semon, West & Hubert Sts., New York, N. Y.

Bausch & Lomb Optical Co., St. Paul & Smith Sts., Rochester, N. Y.

Fry Glass Co., H. C., Rochester, Pa.

Jefferson Glass Co., Follansbee, W. Va.

Lancaster Lens Co., 220-26 W. Main St., Lancaster, O.

Macbeth-Evans Glass Co., Chamber of Commerce Bldg., Pittsburgh, Pa.

Matisse, C. & A., 543-49 E. 116th St., New York, N. Y.

REGISTERS, Autographic and Manifold

American Sales Book Co., 631 Magee St., Elmira, N. Y.

Autographic Register Co., Tenth & Clinton Sts., Hoboken, N. J. "Shouperior."

Automatic Bookkeeping Register Co., 18th & Wyandotte Sts., Kansas City, Mo.

Bookkeeper's Register Co., 803 W. Madison St., Chicago, Ill.

Champion Register Co., 6921 Colfax Rd., Cleveland, O.

Egry Register Co., 429 E. Monument St., Dayton, O.

Globe Register Co., 2412-20 Reading Rd., Cincinnati, O.

Hamilton Autographic Register Co., Hamilton, O. (See page 569.)

K. & B. Register Co., Hamilton, O. (See page 569.)

McCaskey, Alliance, O.

National Cash Register Co., Dept. 18503, Dayton, O. (See page 567.)

Shouperior—See Autographic Register Co.

Standard Register Co., Albany Ave. & Big Four Tracks, Dayton, O.

United Autographic Register Co., 2316-40 W. 43rd St., Chicago, Ill. (See page 569.)

REGISTERS, MANIFOLD—See Registers, Autographic

REGRINDING MACHINES—See Machines, Portable Cylinder Reboring and Regrinding

REGRINDING OF BALL BEARINGS—See Ball Bearings, Reground

REGRINDING OF CYLINDERS—See Cylinders, Regrinding of

REGULATORS, Acetylene Pressure or Reducing Valve

(For use with acetylene lamps or starters; See also Controllers, Acetylene Lamp)

Bishop-Babcock-Becker Co., E. 49th St. & Hamilton Ave., Cleveland, O.

Imperial Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill. (See page 733.)

Prest-O-Lite Co., Indianapolis, Ind. (See page 89.)

REGULATORS, CARBURETOR, FOR FORDS—See Regulators, Thermostatic Carburetor

REGULATORS, Electric Light, for Fords

(For controlling the flow of current to headlights to prevent burning out of bulbs at high engine speeds)

Abco—See American Battery Co.

American Automobile Accessories Co., B. & O. R. R. & Blue Rock St., Cincinnati, O. "Brilite."

American Battery Co., 1132-34 Fulton St., Chicago, Ill. "Abco."

Aske Automatic Voltage Regulator Co., Providence Bldg., Duluth, Minn.

Ballman-Whitten Mfg. Co., 4440 Olive St., St. Louis, Mo. "Steadylite."

Banes & Muench, 70th Ave. & York Rd. (Oak Lane), Philadelphia, Pa.

Benjamin Electric Mfg. Co., Chicago, Ill. "Regulite." (See page 139.)

Brilite—See American Automobile Accessories Co.

Clark Realite—See Hilton & Burks.

Constolite—See Detroit Starter Co.

Detroit Starter Co., 30-32 E. Larned St., Detroit, Mich. "Constolite."

Dimit—See Suburban Lighting & Gas Engine Co.

Equal-Lite—See H. E. Co.

Equal Light Co., 121 N. Fourth St., Paducah, Ky.

Evenlite—See St. Louis Electrical Works.

Evergood—See Grossman Mfg. Co.

Fodrectifier—See Warnerite Co.

General Electric Co., Schenectady, N. Y. "Waynelite." (See pages 564 and 565.)

Grossman Mfg. Corp., Emil, Bush Terminal Bldg. No. 20, Brooklyn, N. Y. "Evergood."

H. E. Co., 226-30 Lafayette St., New York, N. Y. "Equal-Lite."

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The old way

The new way

A man should not do the work a machine will do for him

A merchant, with all his troubles, should never do the work that a machine does better and quicker.

Our newest model National Cash Register makes the records which a merchant needs to control his business. It does fifteen necessary things in three seconds.

Without the register a man cannot do these things in half an hour.

With the register, even a new clerk can do them just by pressing the keys.

Our new electric machines are as much better than old machines as an up-to-date harvester is ahead of a sickle for cutting grain.

The latest model National Cash Register is a great help to merchants and clerks.

It pays for itself out of what it saves.

Merchants need National Cash Registers now more than ever before

FILL OUT THE COUPON AND MAIL TODAY

Dept. 1850? The National Cash Register Company, Dayton, Ohio.
Please give me full particulars about the up-to-date N. C. R. System for my kind of business

Name_____

Business_____

Address_____

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REGULATORS, Electric Light, for Fords (Continued)

Hastings Mfg. Co., Hastings, Mich. "Lite-a-Ford."
Hilton & Burks, Texola, Okla. "Clark Realite."
Hungate Co., 609 N. Palisade Ave., Chicago, Ill. "Whytelite."
Jefferson Electric Co., 431 S. Green St., Chicago, Ill.
Jonny Bros., Mueller Bldg., Cincinnati, O.
Koch Auto Supply Co., 707 Second Ave. S., Minneapolis, Minn. (See page 255.)
Lite-a-Ford—See Hastings Mfg. Co.
Moco Laboratory, 9 S. Dewey St., Oklahoma City, Okla.
Morse, Frank W., 289 Congress St., Boston, Mass. (See page 453.)
New York Coil Co., 338-40 Pearl St., New York, N. Y.
Perrin Mfg. Co., Detroit, Mich.
Power Spark Intensifer Co., Watertown, S. Dak.
Regulite—See Benjamin Electric Mfg. Co.
St. Louis Electrical Works, 4057 Forest Park Blvd., St. Louis, Mo. "Rivenlite." (See page 269.)
Steadylite—See Ballman-Whitten Mfg. Co.
Suburban Lighting & Gas Engine Co., Summit & Lagrange Sts., Toledo, O. "Dimit."
Van Sickien Co., Elgin, Ill. (See page 627.)
Warnerite Co., 518 Harrison St., Davenport, Ia. "Fodrectifier."
Waynelite—See General Electric Co.
Westphal, H. F., 3217 North Ave., Milwaukee, Wis.
Whytelight—See Hungate Co.

REGULATORS, Fuel Feed

(For automatically regulating the fuel feed on steam cars)

Ofeldt & Sons, F. W., Nyack, N. Y.

REGULATORS, HEADLIGHT, FOR FORDS —See Regulators, Electric Light

REGULATORS, LIGHT, FOR FORDS—See Regulators, Electric Light

REGULATORS, Tank Pressure

(For regulating the pressure on gasoline or oil tanks when pressure is taken from the exhaust)

Boston—See Powell Co.
Buckeye—See Central Brass & Fixture Co.
Central Brass & Fixture Co., Dept. A., Springfield, O. "Buckeye." (See page 137.)
Imperial Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill. (See page 733.)
Locke Regular Co., 76 North St., Salem, Mass.
Lunkenheimer Co., Beekman & Waverly Sts., Cincinnati, O.
Middy—See Powell Co.
Neptune—See Powell Co.
Powell Co., Wm., 2525 Spring Grove Ave., Cincinnati, O. "Neptune," "Boston," "Middy." (See page 195.)

REGULATORS, THERMOSTATIC, Carbureter, for Fords

(Thermostatic attachment to automatically adjust carbureter needle for all changes in temperature)

Goodrich-Lenhart Mfg. Co., 429 Widener Bldg., Philadelphia, Pa. (See page 111.)
Seek Mfg. Co., 224 S. 24th St., Philadelphia, Pa.

REGULATORS, Water Circulating

(Thermostatic regulators for maintaining a constant temperature of the cooling water on gasoline cars; See also Covers or Shields, Automatic Radiator)

Findeisen & Kropf Mfg. Co., 21st & Rockwell Sts., Chicago, Ill. "Rayfield." (See page 147.)
Fulton Co., Knoxville, Tenn. "Syiphon."
Motor Cooling System Co., Charles & Lombard Sts., Baltimore, Md.
Rayfield—See Findeisen & Kropf Mfg. Co.
Syiphon—See Fulton Co.

REGULATORS, Water Level

(For automatically maintaining the proper level of water in the boilers of steam cars

Ofeldt & Sons, F. W., Nyack, N. Y.

REGULATORS, Window

(For opening and closing the windows in closed cars)

Clement Mfg. Co., Amesbury, Mass.
Cowles & Co., C., New Haven, Conn. "Fisher." (See page 339.)
Dura Mechanical Hardware Co., 3149 Monroe St., Toledo, O.
Fisher—See Cowles & Co.
Liberty Works, Egg Harbor City, N. J.
O'Brien Mfg. Co., Joseph F., 391 Broadway, New York, N. Y.
Perfect Window Regulator Co., 20 Exchange Place, New York, N. Y. (See page 569.)

RELEASE CLEVICES—See Clevices, Automatic Tractor Release

RELEASERS, Clutch, for Fords

(For automatically releasing the clutch when the foot brake is applied)

Apco Mfg. Co., Eddy St., Providence, R. I.
Humboldt Machine & Stamping Co., 31-35 Tenth St., Long Island City, N. Y.
Ideal Brass Works, 560 N. Elder Ave., Indianapolis, Ind.
Ideal Mfg. Co., 1525 Main St., Anderson, Ind.
McEwen, R. A., Natoma, Kans.
Metal Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.
Perkins-Campbell Co., 634 Broadway, Cincinnati, O. (See page 227.)
Zimmerman's Garage, 247 W. Main St., Valparaiso, Ind.

RELIEF COCKS—See Cocks; also Cups, Spring Key

RELINERS, TIRE—See Shoes, Inner Tire

REMAGNETIZERS, MAGNET—See Chargers, Magneto Magnet

REMOVABLE RIMS—See Rims, Removable

REMOVABLE WHEELS—See Wheels, Wire

REMOVABLE WHEELS FOR FORDS—See Wheels, Demountable

REMOVERS, BUSHING, FOR FORDS—See Extractors, Bushing

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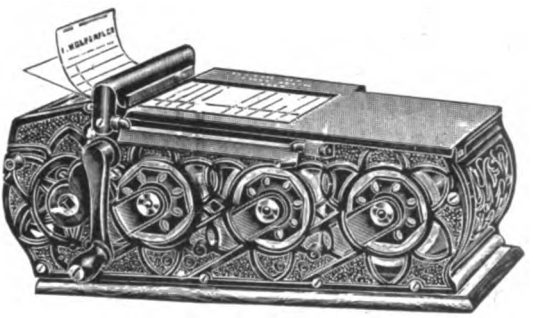

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REMOVERS, Carbon

(Chains or balls for use in cylinders to remove carbon; for Chemical Carbon Removers—See Compounds, Carbon Removing; for Oxygen Carbon Burners—See Machines, Motor Decarbonizing; for Steam Carbon Removers—See Moisteners, Air or Mixture)

Teepell, Edward A., 1523 N. 62d St., Philadelphia, Pa.

REMOVERS, ENAMEL—See Removers, Paint

REMOVERS, Paint, Enamel and Varnish

Acme White Lead & Color Works, 1740-1800 St. Aubin Ave., Detroit, Mich.

Ad-El-Ite—See Adams & Elting Co.

Adams & Elting Co., 716-26 Washington Blvd., Chicago, Ill. "Ad-el-ite." (See page 199.)

Albany Chemical Co., 22 Broadway, Albany, N. Y.

Behlen & Bro. H., 371 Pearl St., New York, N. Y.

Berry Bros., 71 Lieb St., Detroit, Mich.

Bilchaco—See Billings-Chapin Co.

Billings-Chapin Co., Cleveland, O. "Bilchaco."

Blue Ribbon Mfg. Co., 27 Baldwin St. (Charlestown), Boston, Mass. "Premium."

Bradley & Vrooman Co., 2629 Dearborn St., Chicago, Ill. "Crown."

Bridgeport Wood Finishing Co., New Milford, Conn.

Callery & Co., W. W., 188 36th St., Pittsburgh, Pa.

Chalmers Chemical Co., 115 Chestnut St., Newark, N. J. "Phenoid."

Crown—See Bradley & Vrooman Co.

Denegre Baked Enamel Remover Co., 1922-24 Ave. F, Birmingham, Ala.

Detroit White Lead Works, 530-60 Milwaukee Ave., E., Detroit, Mich. "Rogers Abluent."

Eberson-Lindsley Paint Co., 1830-32 Morgan St., St. Louis, Mo. "V. & P."

Eclipse—See Gould & Cutler.

Enterprise Paint Mfg. Co., Peoria & Van Buren Sts., Chicago, Ill. "Noxall."

Forest City Paint & Varnish Co., 8334 Lakeside Ave., Cleveland, O.

Gillespie & Son, Chas. H., 19 Dey St., Jersey City, N. J. "Monarch Bull Dog."

Glidden Co., Cleveland, O. (See page 741.)

Gould & Cutler, 45 Sudbury St., Boston, Mass. "Eclipse."

H C Red Label Chemical Co., Boston, Mass.

Idol-Yusso—See Schlegel Mfg. Co.

Jewel—See Wadsworth-Howland Co.

Klean-Itt—See Lawrence & Co.

Klensa—See Standard Varnish Works.

Kut-Kote—See Thurston Co.

Lawrence & Co., W. W., Pittsburgh, Pa. "Klean-Itt."

Lingerwett—See Wilson Remover Co.

Lucas & Co., John, 322-30 Race St., Philadelphia, Pa. "Mirac."

Mirac—See Lucas & Co.

Moller & Schumann Co., 3 Gerry St., Brooklyn, N. Y.

Monarch Bull Dog—See Gillespie & Son.

Nice, Eugene E., 272-74 S. Second St., Philadelphia, Pa.

Noxall—See Enterprise Paint Mfg. Co.

Oakley Chemical Co., 22 Thames St., New York, N. Y. "Oakite."

Oakite—See Oakley Chemical Co.

Parrott Varnish Co., 453 N. Washington Ave., Bridgeport, Conn.

Phenoid—See Chalmers Chemical Co.

Premium—See Blue Ribbon Co.

Rogers Abluent—See Detroit White Lead Works.

Schlegel Mfg. Co., Oscar, 111 E. 12th St., New York, N. Y. "Idol-Yusso."

Standard Varnish Works, 90 West St., New York, N. Y. "Klensa."

Thurston Co., F. W., 1832-34 S. Clark St., Chicago, Ill. "Kut-Kote."

V. & P.—See Eberson-Lindsley Paint Co.

Wadsworth-Howland Co., 225 N. Carpenter St., Chicago, Ill. "Jewel."

Wilson Remover Co., 115 Chestnut St., Newark, N. J. "Wonderpaste," "Lingerwett."

Wonderpaste—See Wilson Remover Co.

REMOVERS, PISTON RING—See Tools, Piston Ring

REMOVERS, TIRE—See Tools, Tire

REMOVERS, VARNISH—See Removers, Paint

REMOVING COMPOUNDS—See Compounds, Rust Preventing and Removing; also Compounds, Tar Removing; also Compounds, Carbon Removing

REPAIR ARMS FOR FORDS—See Arms, Crank Case Repair

REPAIR CLAMPS—See Clamps, Spring Repair

REPAIR KNIVES—See Knives, Tire Repair

REPAIR LINKS—See Links, Tire Chain Repair

REPAIR PARTS—See Parts, Repair

REPAIR PLIERS—See Pliers, Tire Repair

REPAIR STANDS—See Stands, Motor Repair; also Stands, Rear Axle Repair

REPAIR TRUCKS—See Trucks, Repair

REPAIRERS, SPRING—See Clamps, Spring Repair

REPAIRING OF SCORED CYLINDERS—See Cylinders Scored, Repairing of

REPAIRING OF WHEELS—See Wheels, Repairing of

REPORTS, Used Car Market

Chicago Auto Trade Association, 2136 S. Michigan Ave., Chicago, Ill. (See page 395.)

RESEATERS, VALVE—See Tools, Valve Reseating; also Parts, Speedometer Repair; also Parts, Magneto, Coil and Distributor

RESERVE COCKS—See Valves, Two Way Tank

RESERVE COCKS FOR FORDS—See Cocks, Fuel Supply

RESERVE TANKS—See Tanks, Emergency or Reserve

RESERVE VALVES—See Valves, Two Way Tank

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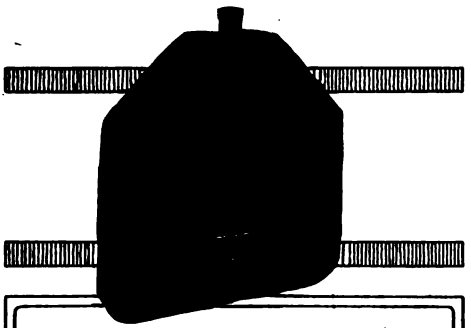

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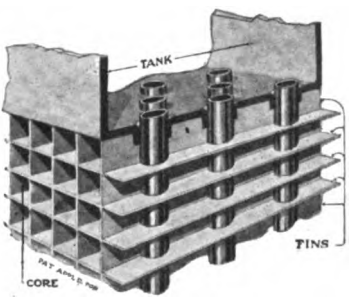

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RESERVE VALVES FOR FORDS—See Cocks, Fuel Supply and Reserve

RESTS, BACK—See Rests, Cushion; also Rests, Motorcycle Back

RESTS, Bow

(See also Holders, Top; also Separators, Bow)

American Brass Novelty Co., Grand Haven, Mich.

Anchor—See North & Judd Mfg. Co.

Attwood Brass Works, Grand Rapids, Mich. (See page 531.)

Campbell—See Perkins-Campbell Co.

Desoco—See Detroit Socket Co.

Detroit Socket Co., 814 Jefferson Ave., W., Detroit, Mich. "Desoco."

Eberhard Mfg. Co., 2734 Tennyson Rd., Cleveland, O.

Hoover Co., W. H., New Berlin, O.

Jonah & George, Merrimac, Mass.

North & Judd Mfg. Co., New Britain, Conn. "Anchor." (See page 521.)

O'Brien Mfg. Co., Joseph F., 391 Broadway, New York, N. Y.

Perkins-Campbell Co., 634 Broadway, Cincinnati, O. "Campbell." (See page 227.)

Smith & Co., Jos. N., E. Grand Blvd. & Dubois St., Detroit, Mich.

Western Brass Mfg. Works, Marshall Blvd., 21st St. & C., B. & Q. R. R., Chicago, Ill.

Woodruff & Sons Co., Walter W., Mount Carmel, Conn.

RESTS, Cushion Back

(Special removable cushions for back rests for drivers seats)

Atlas Specialty Mfg. Co., 16-22 E. 24th St., Chicago, Ill. (See page 123.)

Automobile Apparel Co., Bush Ave., Port Chester, N. Y.

Claus, Rudolph, Claus Bldg., Ottawa, Ill. "Comfo-Lux."

Columbus Upholstery Supply Co., 112 N. Third St., Columbus, O.

Comfo-Lux—See Claus, Rudolph.

Dunham Co., Thos., Aurora, Ill. (See page 75.)

E Z—See Economy Seat Co.

Economy Seat Co., 3132-36 S. Canal St., Chicago, Ill. "E Z," "Kum-fy."

Gordon Co., J. P., 303 N. Fourth St., Columbus, O. (See page 225.)

Hoover Co., W. H., New Berlin, O.

Kum-fy—See Economy Seat Co.

Powers Mfg. Co., 1340 Sycamore St., Waterloo, Ia.

RESTS, Cushion Back, for Fords

(Special cushions to apply to top of seat back to increase height of back cushion)

Copp Co., George W., 351-55 W. 52d St., New York, N. Y. (See page 227.)

Gordon Co., J. P., 303 N. Fourth St., Columbus, O. (See page 225.)

Wood Co., W. C., 74 Western Ave., Minneapolis, Minn.

RESTS, FOOT—See Rests or Rails, Foot

RESTS, Heel

(For rendering operation of clutch or accelerator pedals easier and less tiresome)

Auto Pedal Pad Co., 794 Seventh Ave., New York, N. Y.

Bloom Auto Specialty Co., Tiffin, O. "Resto."

Continental Auto Parts Co., Knightstown, Ind.

Comfort—See General Appliance Co.

E-Z Mfg. Co., 4851 Spring Grove Ave., Cincinnati, O.

Fuqua Bros., 2418 W. Main St., Richmond, Va.

General Appliance Co., 100 Boylston St., Boston, Mass. "Comfort."

Hicks, O. H., 2615 E. 78th St., Chicago, Ill.

Humboldt Machine & Stamping Co., 81-85 Tenth St., Long Island City, N. Y.

Lucas & Son, J. L., 3 Fox St., Bridgeport, Conn.

New York Coil Co., 338-40 Pearl St., New York, N. Y.

Resto—See Bloom Auto Specialty Co.

Spiro Mfg. Co., C., 68-72 E. 131st St., New York N. Y

Stanwood Equipment Co., 307 Plymouth Ct., Chicago,, Ill.

RESTS, Heel, for Fords

Lucas & Son, J. L., 3 Fox St., Bridgeport, Conn.

RESTS, Motorcycle Back

F-N—See Fentress-Newton Mfg. Co.

Fentress-Newton Mfg. Co., 255 W. Lafayette St., Detroit, Mich. "F-N."

Standard Metal Mfg. Co., 237 Chestnut St., Newark, N. J. "Weed."

Weed—See Standard Metal Mfg. Co.

RESTS or RAILS, Foot

(See also Hassocks; For heated foot rests—See Heaters, Automobile)

A. Z. Co., 530 W. 56th St., New York, N. Y. (See page 563.)

Aetna Brass Mfg. Co., 1633 E. 55th St., Cleveland, O.

Allen Fire Department Supply Co., Providence, R. I.

Amesbury Brass & Foundry Co., Amesbury, Mass.

Attwood Brass Works, Grand Rapids, Mich. (See page 531.)

Central Brass & Fixture Co., Dept. A., Springfield, O. (See page 137.)

Cowles & Co., C., New Haven, Conn. (See page 339.)

Cox Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y.

Douglas & Lomason Co., 642 Lincoln Ave., Detroit, Mich.

E G Mfg. Co., 250 W. 54th St., New York, N. Y. (Dealers.) (See page 215.)

Eastern Production Co., 137 Leib St., Detroit, Mich. (See page 845.)

Enterprise Brass & Plating Co., Sixth & Raymiller Sts., Cincinnati, O.

Ford-Clark Co., 3125 Perkins Ave., Cleveland, O.

Gemco Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. (See page 135.)

Highton & Sons Co., Wm., Nashua, N. H.

Imperial Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill. (See page 733.)

Jonah & George, Merrimac, Mass.

Keeler Brass Co., 261-71 Godfrey Ave., Grand Rapids, Mich.

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RESTS or RAILS, Foot (Continued)

Monarch Carriage Goods Co., 2833-44 Spring Grove Ave., Cincinnati, O.

Rich Mfg. Co., 1777 Broadway, New York, N .Y. "Rico." (See page 277.)

Rico—See Rich Mfg. Co.

Sargent Mfg. Co., New & Summit Sts., Newark, N. J.

Smith & Co., Jos. N., E. Grand Blvd. & Dubois St., Detroit, Mich.

Star Brass Works, 2623 McGee Ave., Kansas City, Mo.

Warner Electric Co., Walnut & 20th Sts., Muncie, Ind.

Western Brass Mfg. Works, Marshall Blvd. 21st St., & C., B. & Q. R. R., Chicago, Ill.

White Mfg. Co., 155 Cannon St., Bridgeport, Conn.

Whitehouse-LeCompte Mfg. Co., 42-54 Elm St., Newark, N. J.

Woodruff & Sons Co., Walter W., Mount Carmel, Conn.

RESTS or RAILS, Foot, for Fords

(For heated rails—See Heaters, Automobile)

Attwood Brass Works, Grand Rapids, Mich. (See page 531.)

Ford-Clark Co., 3125 Perkins Ave., Cleveland, O.

Humboldt Machine & Stamping Co., 81-85 Tenth St., Long Island City, N. Y.

Western Brass Mfg. Works, Marshall Blvd., 21st St. & C. B. & Q. R. R., Chicago, Ill.

RETAINERS, Ball

Bearings Co. of America, Lancaster, Pa. (See page 125.)

Bossert Corp., Utica, N. Y. (See page 363.)

Worcester Pressed Steel Co., Worcester, Mass.

RETAINERS, BELT, FOR FORDS—See Guides, Fan Belt

RETAINERS, FAN BELT, FOR FORDS—See Guides, Fan Belt

RETAINERS, GREASE, FOR FORDS—See Retainers, Rear Axle Grease

RETAINERS, Rear Axle Grease, for Fords

(For preventing leakage of grease from rear axle on to brakes, wheels or tires)

Apco Mfg. Co., Eddy St., Providence, R. I.

Apex Mfg. Co., 19th & Locust Sts., St. Louis, Mo. "Kant-Leek."

Kant-Leek—See Apex Mfg. Co.

Perfection Machine Co., Jeromeville, O.

Petersburg Specialty Co., Petersburg, Ill.

Shurnuff Mfg. Co.—See Zinke Co.

Tarlton, P. E., 456 E. 27th St., Los Angeles, Cal.

Worthington, A. P., 700 N. Main St., Los Angeles, Cal.

Zinke Co., 1323-25 Michigan Ave., Chicago, Ill. Sole Distributors for Shurnuff Mfg. Co., St. Louis, Mo.)

RETARDERS, Automatic Spark, for Fords

(Device to automatically retard spark when starting crank is engaged or to prevent engagement of crank until spark has been retarded)

Kant Kick Spark Set Co., Elkhorn, Wis.

Safety Spark Set Co., Elkhorn, Wis.

RETHREADING TOOLS—See Tools, Tire Valve Rethreading

REVERSE GEARS, MOTOR BOAT—See Gears, Motor Boat Reverse

REVERSING PROPELLER WHEELS, MOTOR BOAT—See Wheels, Motor Boat Reversing

RHEOSTATS, Battery Charging

Allen-Bradley Co., 495-97 Clinton St., Milwaukee, Wis.

Cutler Hammer Mfg. Co., 890 St. Paul Ave., Milwaukee, Wis.

Electric Products Co., Cleveland, O.

General Electric Co., Schenectady, N. Y. (See pages 564 and 565.)

H-B—See Hobart Bros. Co.

Hobart Bros. Co., 118 Water St., Troy, O. "H-B."

Industrial Controller Co., 836 Greenbush St., Milwaukee, Wis.

Leonard Electric Co., Ward, Mt. Vernon, N. Y.

National Electric Controller Co., 154-56 Whiting St., Chicago, Ill.

Westinghouse Electric & Mfg. Co. (E. Liberty), Pittsburgh, Pa.

RIBS, AEROPLANE—See Parts, Aeroplane Wood

RIM BOLTS—See Bolts, Special Demountable Rim

RIM CONTRACTING TOOLS—See Tools, Demountable Rim Contracting

RIM COVERS—See Covers, Cork Pulley Rim

RIM ENAMELS—See Paints, Rim; also Paints, Aluminum and Bronze

RIM PAINTS—See Paints, Rim

RIM PLATES, QUICK DETACHABLE TRACTOR—See Plates, Tractor, Quick Detachable

RIM SHIMS—See Plates, Demountable Rim Wedge

RIM SPREADERS—See Tools, Demountable Rim Contracting

RIM WEDGE PLATES—See Plates, Demountable Rim Wedge

RIMS, Aeroplane Wheel

Mott Wheel Works, Jackson, Mich.

Williams Steel Wheel & Rim Co., Pleasant St. & N. Y., O. & W. R. R., Utica, N. Y.

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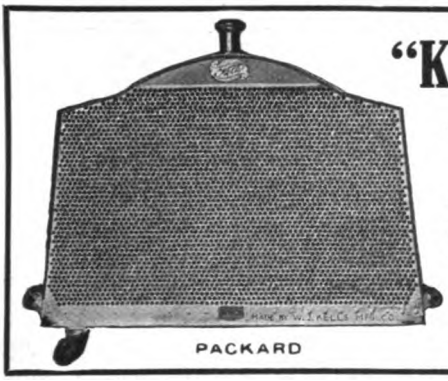

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RIMS, Demountable

Baker—See Stone-Thompson Mfg. Co.
Chicago Wheel & Rim Co., 2010-12 Wabash Ave., Chicago ,Ill. (Dealers.) (See page 763.)
City Auto Tire & Supply Co., Chester Ave. & E. 24th St., Cleveland, O. (Dealers.) (See page 669.)
Cleveland Welding & Mfg. Co., Berea Rd. & W. 117th St., Cleveland, O. "Parker."
Dahl Punctureless Filler & Rim Co., 15th St. & Hennepin Ave., Minneapolis, Minn.
Firestone Steel Products Co., Miller St. & Sweitzer Ave., Akron, Ohio
Funk—See Mott Wheel Works.
Howard Demountable Rim Co., 1850 E. State St., Trenton, N. J.
Jaxon Steel Products Co., Jackson, Mich.
Kelsey Wheel Co., Detroit, Mich. (See page 355.)
Michelin Tire Co., Milltown, N. J.
Mott Wheel Works, Jackson, Mich. "Quality," "Funk."
Parker—See Cleveland Welding & Mfg. Co.
Presto Inter-Rim Co., 940 Commonwealth Ave., Boston, Mass.
Quality—See Mott Wheel Works.
Spranger Wire Wheel Co., Clayton Ave., Detroit, Mich.
Standard Parts Co., Cleveland, O. "Stanweld." (See pages 408 and 409.)
Stanweld—See Standard Parts Co.
Stone-Thompson Mfg. Co., 1502 Michigan Ave., Chicago, Ill. "Baker." (See page 577.)
Weston-Mott Co., Flint, Mich.

RIMS, Demountable, for Fords

Baker—See Stone-Thompson Mfg. Co.
Cleveland Welding & Mfg. Co., Berea Rd. & W. 117th St., Cleveland, O. "Parker."
Howard Demountable Rim Co., 1850 E. State St., Trenton, N. J.
Parker—See Cleveland Welding & Mfg. Co.
Stone-Thompson Mfg. Co., 1502 Michigan Ave., Chicago, Ill. "Baker." (See page 577.)

RIMS, DETACHABLE—See Rims, Quick Detachable

RIMS, Emergency, for Fords

Twin-Rim Co., Everett, Mass.

RIMS, Motorcycle Wheel

Mott Wheel Works, Jackson, Mich.
Williams Steel Wheel & Rim Co., Pleasant St. & N. Y., O. & W. R. R., Utica, N. Y.

RIMS, Quick, Detachable

Chicago Wheel & Rim Co., 2010-12 Wabash Ave., Chicago, Ill. (Dealers.) (See page 763.)
City Auto Tire & Supply Co., Chester Ave. & E. 24th St., Cleveland, O. (Dealers.) (See page 669.)
Kelsey Wheel Co., Detroit, Mich. (See page 355.)
Mott Wheel Works, Jackson, Mich.
Standard Parts Co., Cleveland, O. "Stanweld." (See pages 408 and 409.)
Stanweld—See Standard Parts Co.

RIMS, Rubber or Composition Steering Wheel

(For complete steering wheels—See Wheels, Steering)
General Insulate Co., 1008-14 Atlantic Ave., Brooklyn, N. Y.
Luzerne Rubber Co., Trenton, N. J.
Stokes Rubber Co., Jos., Trenton, N. J.

RIMS, Standard

American Tube & Stamping Co., 471 Hancock Ave., Bridgeport, Conn.
Kelsey Wheel Co., Detroit, Mich. (See page 355.)
Mott Wheel Works, Jackson, Mich.
Standard Parts Co., Cleveland O. "Stanweld." (See pages 408 and 409.)
Stanweld—See Standard Parts Co.
Stone-Thompson Mfg. Co., 1502 Michigan Ave., Chicago, Ill. (See page 577.)
Williams Steel Wheel & Rim Co., Pleasant St. & N. Y., O. & S. W. R. R., Utica, N. Y.

RIMS, STEERING WHEEL—See Rubber Steering Wheel Rims; also Wood Steering Wheel Rims

RIMS, Wood Steering Wheel

(For complete steering wheels—See Wheels, Steering)
American Wood Rim Co., Onaway, Mich.
Haberkorn & Co., C. H., Brooklyn & Eighth Sts., Detroit, Mich
Standard Steering Wheel Co., Cleveland, O.
Tucker Woodwork Co., Sidney, O.
Wayne Steering Wheel & Bow Co., Wayne, Mich.

RIMS or Felloes, Wood

Campbell & Dann Mfg. Co., Tullahoma, Tenn.
Columbus Bending Co., Columbus, O.
Crane & MacMahon, St. Marys, O. "Nut," "Star."
Eberly & Orris Mfg. Co., Mechanicsburg, Pa.
Hartwell & Co., C. L., Chicago Heights, Ill.
Jones & Co., Phineas, 301 Market St., Newark, N. J.
Koller & Co., J. B., Mechanicsburg, Pa.
Lehzelter & Son Co., Philip, Lancaster, Pa. (See page 669.)
Nut—See Crane & MacMahon.
Pioneer Pole & Shaft Co., Piqua, O.
Skinner Bending Co., J. M., Broadway & Wabash R. R., Toledo, O.
Star—See Crane & MacMahon.
Tucker Woodwork Co., Sidney, O.

RING GAGES—See Gages, Plug and Ring

RING GRINDERS—See Grinders, Piston Ring

RING TOOLS—See Tools, Piston Ring

RINGS, DUST—See Washers, Felt

RINGS, Piston

(See also Machine Work)
A. C. Non-Leakable Piston Ring Co., Compton, Ill.
Acme—See Motor Accessories Corp.
Albany Hardware & Specialty Mfg. Co., Albany, Wis. "New Universal."
Albertson & Co., First & Virginia Sts., Sioux City, Ia. "Sioux."
Alloyanum—See Miller Mfg. Co.
American Piston Ring Co., 3-5 E. German St., Baltimore, Md. "Perfection."
American Piston Ring Co., 211 Halsey St., Newark, N. J.

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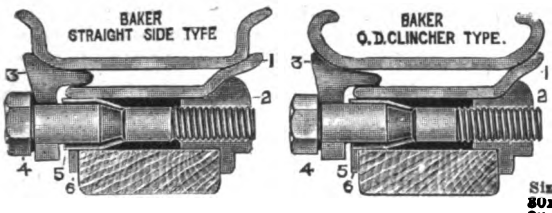
Stone-Thompson Mfg. Company

1502 Michigan Ave.
Chicago

Successors to Wholesale and Manufacturing Departments Universal Rim Company



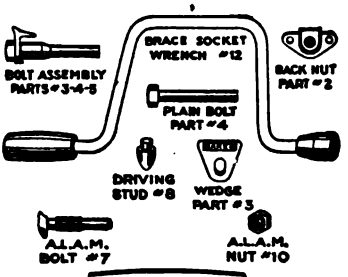
Baker Rims and Parts

READ: When ordering spare rims or parts of any kind always give size of tire, make and year of car, and state whether rims are wanted for straight side or clincher type of tire.

Price List Baker Rims

Size	Spare Rims S. S.	Spare Rims Q.D.CL.	Felloe Bands
30x3½	$4.25	$4.00	$1.90
32x3½	4.25	4.40	2.10
34x3½	4.40	4.60	2.15
36x3½	4.50	4.70	2.20
32x4	4.40	4.60	2.25
34x4	5.05	5.25	2.40
36x4	5.40	5.70	2.60
34x4½	6.00	6.40	2.75
36x4½	6.30	6.70	2.90
35x4½		7.00	3.05
30x3½ Baker Special			
Solid Clincher Demountable			3.00

Prices for complete sets of Baker Rims, including 5 rims, 4 felloe bands, and necessary parts for 4 wheels, will be quoted upon request.



BAKER RIM PARTS

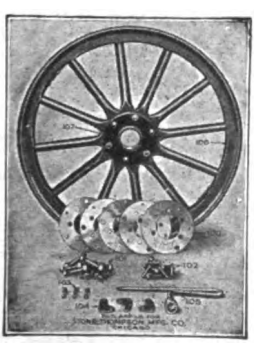
Price List

	Each
Back Nut, No. 2	$ .20
Wedge No. 3	.18
Plain Bolt, No. 4	.20
Bolt Assembly No. 3-4-5	.40
Front Plate No. 6	.10
ALAM Bolt No. 7	.15
Drive Stud No. 8	.10
Supporting Stud No. 9	.10
ALAM Nut No. 10	.06
Anchor Plate No. 11	.20
Brace Socket Wrench No. 12	.75

WRITE FOR CATALOG CONTAINING ALL POPULAR TYPES OF RIMS. ALL SIZES AND TYPES CARRIED IN STOCK *For* IMMEDIATE SHIPMENT

Stone Demountable Wheels for Ford Cars

Stone Demountable Wheel attachments make the four wheels now on the Ford quick detachable and provide a fifth or extra wheel. Regular Ford hubs are used.



Provides a quick change for either a flat tire or broken wheel by removing three nuts.

No machine work for the dealers in applying.

Retail price $14.50 complete with spare wheel.

Retail price, less spare wheel, $11.00.

Stone Shock Absorber

Double coiled springs of finest material, giving greatest liveliness with greatest strength.

A two-inch play instead of an inch and a half. This stops jolts that get by others and practically does away with any chance of a broken leaf spring.

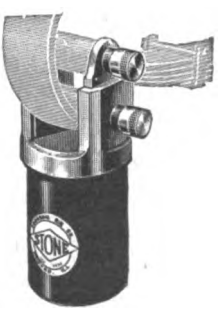
Four bearing parts instead of two. This preserves alignment and prevents side wear.

An adjustment with a range of fifteen hundred pounds.

Made to fit all weights of cars, with scroll end elliptic, semi-elliptic and platform springs.

Price, per pair, any type, $12.00.

Orders must state make and year of car, and whether roadster or touring



All Prices f.o.b. Chicago
Subject to Change

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RINGS, Piston (Continued)

Auto Engine Works, University Ave. & Griggs St., St. Paul, Minn.

Auto Parts Mfg. Co., 217 W. Seventh St., Sioux City, Ia.

B-W.—See Ballman-Whitten Mfg. Co.

Baker Valve Co., 1847 E. 28th St., Minneapolis, Minn. "Vapor-Tight."

Blettner, Geo. H., 1401-05 Jackson Blvd., Chicago, Ill.

Bridgeport Piston Ring Co., Connecticut Ave. & Third St., Bridgeport, Conn.

Buffalo Piston Ring Co., Builders Exchange, Buffalo, N. Y.

Burd High Compression Ring Co., 307 S. Main St., Rockford, Ill.

Canton Auto Parts Mfg. Co., Canton, O. "Kurtz." (See page 251.)

Cassidy Co., Edward A., 280 Madison Ave., New York, N. Y. (Sales Department for Du Bois Piston Ring Co., Albany, N. Y.) "Tenion." (See page 71.)

Chance Co., Centralia, Mo.

Chopa Piston Ring Co., J. A., 264 E. Jefferson Ave., Detroit, Mich.

Continental Piston Ring Co., 648-50 Marshall Ave., Memphis, Tenn. "Hi-Comp."

Davidson Multiple Ring Co., 227 W. 64th St., New York, N. Y.

Detroit Piston Ring Co., 49-57 Richmond Ave., Detroit, Mich.

Double Seal Ring Co., 109 Throckmorton St., Fort Worth, Tex.

Du Bois Piston Ring Co.—See Cassidy Co.

Eclipse—See Hope Machine Co.

Eco Mfg. Co., 53 State St., Boston, Mass. (See page 587.)

End-Oxy Appliance Co., Trenton, N. J. "Leektite."

Ever-Tyte Piston Ring Co., 1607 Kingsland St., St. Louis, Mo. (See page 589.)

Fulton Sales Co., 624 Michigan Ave., Chicago, Ill. (Sole Distributors for Trump Mfg. Co., Crown Point, Ind.)

Gill Mfg. Co., 351-59 W. 59th St., Chicago, Ill.

Green Engineering Co., Fourth & St. Clair Sts., Dayton, O.

Hammered Piston Ring Co. of America, Dept. D., Newark, N. J. (See page 581.)

Harward Mfg. Co., 3939 Magnolia Ave., St. Louis, Mo.

Hebert Mfg. Co., Franklin, N. H.

Hi-Comp—See Continental Piston Ring Co.

Higginson-Gibson Mfg. Co., 74 Atlantic St., Boston, Mass. "Titan."

Holmes, George L., 1733 Broadway, New York, N. Y. (Eastern Distributor for "Hi-Comp" Rings. (See page 383.)

Hope Machine Co., 2310-12 N. Second St., Philadelphia, Pa. "Eclipse."

Houpert Machine Co., Harris Ave. & Marion St., Long Island City, N. Y. (See page 491.)

Indiana Piston Ring Co., Hagerstown, Ind. "Teetor."

I. C. P.—See Iron City Products Co.

Inland Machine Works, 818 Mound St., St. Louis, Mo. (See page 619.)

Iron City Products Co., Pittsburgh, Pa. "I. C. P." (See pages 579 and 580.)

K-P—See Keys Piston Ring Co.

Kant-Leek—See Motor Accessories Corp.

Keys Piston Ring Co., 3020 Olive St., St. Louis, Mo. "K-P." (See page 597.)

Kurtz—See Canton Auto Parts Mfg. Co.

Lake Sales Co., 1947 Broadway, New York, N. Y. (Sole Distributors for Wasson Piston Ring Co., Plainfield, N. J.) (See page 591.)

Lawrie Co., Fred'k S., Odd Fellows Bldg., Indianapolis, Ind. (Sales Agents.) (See page 867.)

Leak-Proof—See McQuay-Norris Mfg. Co.

Leektite—See End-Oxy Appliance Co.

McCadden Machine Works, St. Cloud, Minn.

McQuay-Norris Mfg. Co., Dept. G., St. Louis, Mo. "Leak-Proof" "Superoyl." (See page 583.)

M.-P.—See Metal Products Co.

Merritt Co., S. Whyle, 133d St. & 12th Ave., New York, N. Y.

Metal Products Co., 919-21 N. Market St., St. Louis, Mo. "M.-P."

Micro Piston Ring Co., 116 Nassau St., New York, N. Y.

Miller Mfg. Co., Harry A., 219 E. Washington St., Los Angeles, Cal. "Alloyanum."

Modern Electric & Machine Co., 936-40 Fort Wayne Ave., Indianapolis, Ind. "R. & M. Conform."

Motor Accessories Corp., St. Louis, Mo. "Kant-Leek." "Acme." (See page 587.)

Munger—See Splitdorf Electrical Co.

New Universal—See Albany Hardware & Specialty Mfg. Co.

Nilson-Miller Co., 13th & Hudson Sts., Hoboken, N. J. "Record."

No-Leak-O Piston Ring Co., 824 W. North Ave., Baltimore, Md. (See page 587.)

Non Set—See Stevens & Co.

Pedrick—See Wilkening Mfg. Co.

Pennsylvania Piston Ring Co., 203-05 St. Clair Ave., N. E., Cleveland, O. "Pepco." (See page 587.)

Pepco—See Pennsylvania Piston Ring Co.

Perfection—See American Piston Ring Co.

Piston Ring Co., 113 Sanford St., Muskegon, Mich. "Sta-Tite," "Quality." (See page 619.)

Prescott Auto Parts Co., Webster, Mass. (See page 591.)

Pressure Proof Piston Ring Co., 169 Massachusetts Ave., Boston, Mass. (See page 619.)

Quality—See Piston Ring Co.

R & M Conform—See Modern Electric & Machine Co.

Record—See Nilson-Miller Co.

Rex Piston Ring Co., Rivard & Mullet Sts., Detroit, Mich. (See page 615.)

Schaap Automobile Co., 344 Cumberland St., Brooklyn, N. Y. (See page 655.)

Seal-Tite Piston Ring Co., Minneapolis, Minn. (See page 619.)

Sioux—See Albertson & Co.

Spacke Machine & Tool Co., Indianapolis, Ind. (See page 427.)

Splitdorf Electrical Co., Newark, N. J. "Munger."

Sta-Tite—See Piston Ring Co.

Stevens & Co., 375 Broadway, New York, N. Y. "Non Set."

Superior—See White Machine Works.

Superoyl—See McQuay-Norris Mfg. Co.

Teetor—See Indiana Piston Ring Co.

Tell-Tale—See Vulcan Machine & Tool Co.

Tenion—See Cassidy Co.

Testite Piston Ring Co., Freeport, N. Y.

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ICP

RINGS FOR PISTONS

The Secret of Power Economy

LEAKY piston rings in a motor hit the owner's pocketbook from three angles: (1) They waste fuel, by allowing part of each explosive charge to escape without results. (2) They waste oil, by permitting it to creep upward into the combustion chamber where it should not be. (3) They invite rapid carbonization and frequent overhauls.

And in addition, they take the ginger out of an otherwise perfect motor, making it slow to "pick up," sluggish on the level and balky when traveling on even moderate hills.

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ICP RINGS FOR PISTONS

Stop the costly waste and put the ginger back simultaneously by safeguarding the full power of every explosion with ICP RINGS FOR PISTONS

Held snugly, but without friction, against the cylinder walls by a spiral formation due to joining two similar but oppositely-acting rings in a dual unit, ICP RINGS FOR PISTONS remain absolutely gas-and-oil-tight throughout their entire life. Any wear is automatically compensated for by continued outward tension against the cylinder.

The closure, frequently a source of trouble in ordinary rings, is made infallibly tight in ICP RINGS FOR PISTONS by a double-surface construction which cannot be worn or disarranged to cause leakage under any conditions of service. Examine the accompanying illustration of the joint—the arrows show why it cannot leak.

Dealers—Act Now to Increase Both Profits and Prestige. Your order will have prompt attention.

ICP THRUST BEARINGS

meet the most exacting requirements of engineers. Made of highest grade materials in simple and self-aligning types of all standard sizes—for all operating needs.

Avail Yourself of the Co-Operation of Our Engineering Department on Special Problems

IRON CITY PRODUCTS COMPANY • PITTSBURGH, PA.

MANUFACTURERS OF AIRCRAFT, MARINE AND AUTOMOTIVE EQUIPMENT

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HAMMERED!

The axle that bears the load is drop-forged—**hammered**—to give it tensile strength; ability to hold its shape under stress and strain.

AMERICAN HAMMERED PISTON RINGS

are **HAMMERED** for the same reason. It is the one scientifically correct piston ring. Its tension is hammered in for permanence.

Process Hammering makes AMERICAN HAMMERED PISTON RINGS durable and Leak-Tight.

We guarantee them to increase power, save oil and gas, and do away with carbon and spark plug troubles.

Among the country's foremost motor builders who use AMERICAN HAMMERED PISTON RINGS as standard equipment are: Pierce-Arrow, White, Winton, Stearns, Mercer, Stutz, Duesenberg, Kelly-Springfield, Wright-Martin, Aeromarine, Thomas-Morse, Simplex, Gramm-Bernstein, Corbin.

Dealers will be interested in our liberal discounts. Write for details. Everyone who drives a car should read our Booklet, "The Soul of the Motor." Write Dept. D.

THE
Hammered Piston Ring Co. of America
NEWARK, N. J.

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RINGS, Piston (Continued)

Ti-Test Ring Co., 560 W. 36th St., New York, N. Y

Titan—See Higginson-Gibson Mfg. Co.

Trump Mfg. Co.—See Fulton Sales Co.

St., N. E., Minneapolis, Minn.

United States Piston Ring Co., Cleveland, O. (See page 597.)

V-Plex Piston Ring Co., 2133 S. Michigan Ave., Chicago, Ill.

Vapor-Tight—See Baker Valve Co.

Victor—See White Machine Works.

Vulcan Machine & Tool Co., 915 Olive St., St. Louis, Mo. "Tell-Tale." (See page 591.)

Wainwright Engineering Corp., Connersville, Ind. (See page 479.)

Wasson Piston Ring Co.—See Lake Sales Co.

White Machine Works, A. E., Eau Claire, Wis "Victor," "Superior."

Wikening Mfg. Co., 847-49 N. Broad St., Philadelphia, Pa. "Pedrick."

RINGS, Piston, for Fords

Baker Valve Co., 1847 E. 28th st., Minneapolis, Minn. "Vapor Tight."

Burd High Compression Ring Co., 307 S. Main St., Rockford, Ill.

Duplex—See Piston Ring Co.

Eco Mfg. Co., 53 State St., Boston, Mass. (See page 587.)

Franklin Machine Co., Main St. Station, Franklin, N. H.

Hammered Piston Ring Co. of America, Dept. D., Newark, N. J. (See page 581.)

K-P—See Keys Piston Ring Co.

Keys Piston Ring Co., 3020 Olive St., St. Louis, Mo. "K-P." (See page 597.)

Lake Sales Co., 1947 Broadway, New York, N. Y. (Sole Distributors for Wasson Piston Ring Co., Plainfield, N. J.) (See page 591.)

Leak-Proof—See McQuay-Norris Mfg. Co.

McQuay-Norris Mfg. Co., Dept. G, St. Louis, Mo. "Leak-Proof" "Superoyl." (See page 583.)

Micro Piston Ring Co., 116 Nassau St., New York, N. Y.

Modern Electric & Machine Co., 936-40 Fort Wayne Ave., Indianapolis, Ind. "R & M Conform."

Munger—See Splitdorf Electrical Co.

No-Leak-O Piston Ring Co., 824 W. North Ave., Baltimore, Md. (See page 587.)

Piston Ring Co., 113 Sanford St., Muskegon, Mich. "Duplex." (See page 619.)

R & M Conform—See Modern Electric & Machine Co.

Splitdorf Electrical Co., Newark, N. J. "Munger."

Star Specialty Mfg. Co., 227-33 W. Erie St., Chicago, Ill.

Stevens & Co., 375 Broadway, New York, N. Y.

Superoyl—See McQuay-Norris Mfg. Co.

Vapor Tight—See Baker Valve Co.

Wasson Piston Ring Co.—See Lake Sales Co.

RINGS, Tractor Quick Detachable Steering

Loxon—See Universal Lug Co.

Universal Lug Co., 1401 S. 55th Ct., Cicero, Ill. "Loxon."

RIVET CLIPPERS—See Clippers, Bolt and Rivet

RIVET SETS—See Sets, Rivet

RIVETS, Brass and Copper

Atlas Tack Co., Fairhaven, Mass.

Blake & Johnson Co., Waterbury, Conn.

Bridgeport Brass Co., E. Main St., Bridgeport, Conn. "Crown."

Clendenin Bros., Central Ave. & Fawn St., Baltimore, Md.

Cleveland Wrought Products Co., 3590 W. 58th St., Cleveland, O.

Cobb & Drew, Plymouth, Mass.

Crown—See Bridgeport Brass Co.

Eagle—See Plume & Atwood Mfg. Co.

Falls Rivet Co., Kent, O.

Foster Bolt & Nut Mfg. Co., Union Ave. & E. 72d St., Cleveland, O. "Perfection."

Hassall, John, Clay & Oakland Sts., Brooklyn, N. Y. (See page 725.)

Perfection—See Foster Bolt & Nut Mfg. Co.

Plume & Atwood Mfg. Co., 470 Bank St., Waterbury, Conn. "Eagle."

Progressive Mfg. Co., Torrington, Conn.

Rome Brass & Copper Co., Rome, N. Y.

Steele & Johnson Mfg. Co., 779 S. Main St., Waterbury, Conn.

Waterbury Brass Goods Corp., 160 Washington Ave., Waterbury, Conn.

Waterbury Mfg. Co., 568 Main St., Waterbury, Conn.

RIVETS, CLINCH—See Rivets, Tubular

RIVETS, CONTACT—See Platinum; also Points, Sparking

RIVETS, COPPER—See Rivets, Brass

RIVETS, Iron and Steel

American Iron & Steel Mfg. Co., Front & Cumberland Sts., Lebanon, Pa.

American Screw Co., 21 Stevens St., Providence, R. I.

Atlas Bolt & Screw Co., 1289 Marquette Rd., N. E., Cleveland, O.

Champion Rivet Co., Harvard Ave. & E. 108th St., Cleveland, O. "Victor."

Cobb & Drew, Plymouth, Mass.

Columbus Bolt Works Co., Columbus, O. (See page 187.)

Falls Rivet Co., Kent, O.

Garland Nut & Rivet Co., Bailey-Farrell Bldg., Pittsburgh, Pa.

Hassall, John, Clay & Oakland Sts., Brooklyn, N. Y. (See page 725.)

Interstate Iron & Steel Co., 104 S. Michigan Ave., Chicago, Ill.

Ireland & Matthews Mfg. Co., Beard & Chatfield Sts., Detroit, Mich.

Lamson & Sessions Co., 2133 Scranton Rd., Cleveland, O.

Michigan Bolt & Nut Works, Ft. Meldrum Ave., Detroit, Mich.

National Screw & Tack Co., Cleveland, O. (See page 477.)

Newark Rivet Works, 262 Lafayette St., Newark, N. J.

Pittsburg Screw & Bolt Co., Preble Ave. (N. S.), Pittsburgh, Pa.

Plymouth Mills, Plymouth, Mass.

Reed & Prince Mfg. Co., Duncan Ave., Worcester, Mass.

Upson Nut Co., Unionville, Conn.

Victor—See Champion Rivet Co.

RIVETS, PLATINUM—See Platinum; also Points, Sparking

RIVETS, STEEL—See Rivets, Iron

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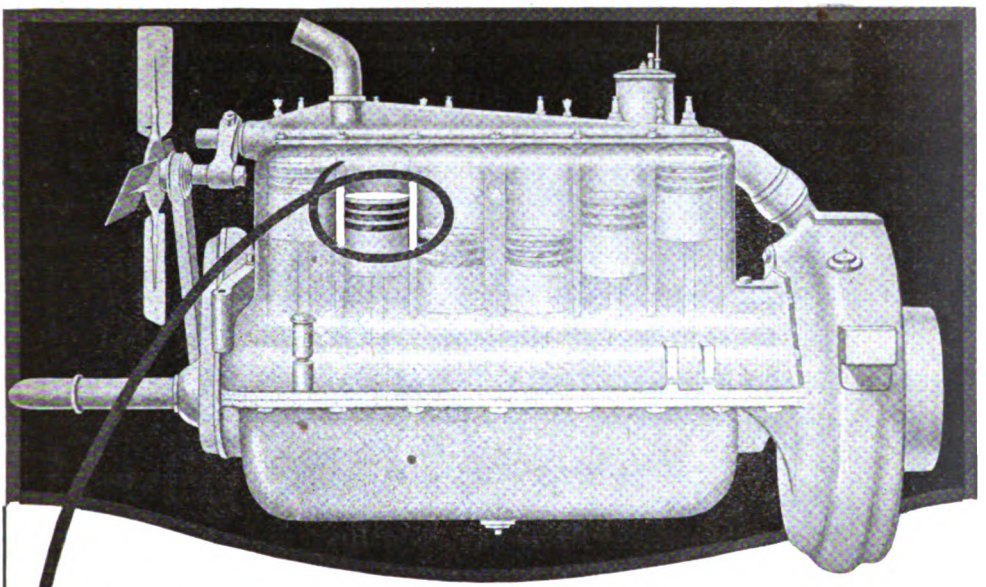

Put in Piston Rings You Can Trust Out of Sight

Piston rings at work are neither seen nor heard. Only by results can you determine their efficiency. Experimenting is both costly and troublesome. It's unnecessary when you can so easily get

McQUAY-NORRIS LEAK-PROOF PISTON RINGS

Proved reliable by seven years of successful performance in developing higher motor efficiency.

By installing them you are sure of definite results in so far as it is possible to govern them by piston rings. Increased compression—more power—less carbon trouble—economy of fuel and oil—motor protection.

Made in all sizes and over-sizes for every model and type of automobile, tractor, engine, truck, motorcycle, motor boat, etc. More than 300 complete service stocks of all standard size and over-size rings are distributed over the country—quickly obtainable through your jobber or supply house. Over 2000 different unusual sizes and over-sizes kept ready on hand at the factory for immediate shipment anywhere.

McQuay-Norris LEAK-PROOF Piston Rings will prove themselves to be the most truly economical and satisfactory piston rings money can buy. There's a lot of piston ring business for you in supplying the demand for McQuay-Norris LEAK-PROOF. Best known—easiest to sell—sure to give satisfaction—any size promptly supplied—good profit on every installation.

For engines that are oil pumpers

McQUAY-NORRIS Superoyl RINGS

REG U S PAT OFF

A specially constructed ring with an oil reservoir that collects all excess oil from the cylinder wall leaving just the film necessary for proper lubrication.

Send for FREE Booklet

"To Have and to Hold Power"—all about power and piston rings. Every dealer, garage and repair man will find it helpful to his business. Write Dept. G.

Manufactured by

McQuay-Norris Mfg. Co. St. Louis, U. S. A.

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San Francisco	Los Angeles	Seattle
Kansas City	St. Paul	Atlanta
	Dallas	

Canadian Factory: W. H. Banfield & Sons, Ltd., 372 Pape Avenue, Toronto.

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RIVETS, Tubular and Clinch

Thompson Mfg. Co., Judson L., Waltham, Mass.
Tubular Rivet & Stud Co., Boston, Mass. (See page 211.)

ROAD GUIDES—See Maps, Road

ROAD MAPS—See Maps, Road

ROAD SIGNS—See Signs, Special Road

ROBE BELTS—See Straps, Robe

ROBE CLIPS—See Clips, Robe

ROBE PLATES—See Plates, Robe Monogram or Initial

ROBE RAIL BAGS—See Bags, Coat Rail

ROBE RAILS—See Rails, Robe

ROBE STRAPS OR BELTS—See Straps, Robe

ROBES, Automobile Lap

Automobile Apparel Co., Bush Ave., Port Chester, N. Y. "Frunt-Seat."
Ayres & Sons, Wm., Cumberland & Fourth Sts., Philadelphia, Pa.
B. E. Mfg. Co., 18-22 W. 18th St., New York, N. Y. (See page 223.)
Ballard & Co., J. O., Malone, N. Y.
Beckman Co., 3167 Fulton Rd., Cleveland, O.
Bishop Co., J. H., Wyandotte, Mich.
Burlington Blanket Co., 711 Oregin St., Burlington, Wis.
Chase & Co., L. C., Boston, Mass. (See page 497.)
Chippewa Falls Woolen Mill, Chippewa Falls, Wis.
Comfort Auto Robe Co., Waterloo, N. Y.
Crosby-Frisian Fur Co., 671 Lyell Ave., Rochester, N. Y.
Curtis & Von Bernuth Mfg. Co., 88 W. Broadway, New York, N. Y.
Davis, Geo. W., 32 Southgate St., Worcester, Mass.
Dawson, J. & E., Fairhill Station, Philadelphia, Pa. "Name-On."
Draper Bros. Co., Canton, Mass.
Dusenbury & Co., Louis, 229 Fourth Ave., New York, N. Y.
Frunt-Seat—See Automobile Apparel Co.
Gausler & Starr Co., Delaware & Walnut Sts., Philadelphia, Pa.
Gordon Co., J. P., 303 N. Fourth St., Columbus, O. (See page 225.)
Hodgman Rubber Co., 806 Broadway, New York, N. Y.
Hoenigsberger, A., 12-16 S. Market St., Chicago, Ill.
Milwaukee Tanning & Clothing Co., Hanover & Florida Sts., Milwaukee, Wis.
Montana—See Wallace Co.
Moore-Smith Co., 250 Devonshire St., Boston, Mass.
Name-On—See Dawson, J. & E.
New York Lap Rope Co., 28-32 W. Third St., New York, N. Y.
Nufur—See Sanitary-Knit Fabric Co.
Oakland—See Robe Lock Co.
Patrick & Co., F. A., Duluth, Minn.
Perfection Fur Robe Co., Chicago, Ill.
Premier Auto Novelty Mfg. Co., 375 W. Broadway, New York, N. Y.
Revillon Frères, 19 W. 34th St., New York, N. Y.
Riley & Co., Wm. B., 288 Chestnut St., Philadelphia, Pa.
Robe Lock Co., 1353 38th Ave., Oakland, Cal. "Oakland."
Robertson Auto Robe Co., 311 First Ave., N. Minneapolis, Minn.
Sanitary-Knit Fabric Co., Columbus, O. "Nufur."
Shelton Looms, Shelton, Conn.
Sho-Fur—See Wisconsin Garment Co.
Stroock & Co., S., 11-13 E. 26th St., New York, N. Y.
Wallace Co., Hugh, 2626 E. Grand Blvd., Detroit, Mich. "Montana."
Winship, W. W., 71 Summer St., Boston, Mass.
Wisconsin Garment Co., 711 Origen St., Burlington, Wis. "Wulauto," "Sho-Fur."
Wulauto—See Wisconsin Garment Co.

ROBES, Special Lap, for Fords

Automobile Apparel Co., Bush Ave., Port Chester, N. Y. "Frunt-Seet"
Frunt-Seet—See Automobile Apparel Co.
Hopewell Bros., Watertown, Mass. (See page 229.)
Invincible—See Peters & Herron Dash Co.
Nathan Novelty Mfg. Co., 84-90 Reade St., New York, N. Y. (See page 153.)
Peters & Herron Dash Co., Gift St., Columbus, O. "Invincible."

ROD ANTI-RATTLERS FOR FORDS—See Anti-Rattlers, Radius Rods

ROD CUTTERS—See Cutters, Rod and Bar

ROD GAGES FOR FORDS—See Gages, Connecting Rod

RODS, Adjustable Valve Lift

(See also Machine Work; also Screw Machine Products)

Bridgeport—See Lyford Bros.
Lyford Bros., 625 Washington Ave., Bridgeport, Conn. "Bridgeport."
Michigan Screw Co., Lansing, Mich.
Rich Steel Products Co., Battle Creek, Mich.
Steel Products Co., Cleveland, O. (See page 400.)
Wilcox Motor & Mfg. Co., Saginaw, Mich. (See page 585.)

RODS, Adjustable Valve Lift, for Fords

(For Valve Stem Adjusters—See Adjusters, Valve Stem)

Acme Mfg. Co., Boonton, N. J.
Hill-Smith Metal Goods Co., Dept. H, Boston, Mass. (See page 221.)
Whitehouse-LeCompte Mfg. Co., 42-54 Elm St., Newark, N. J.

RODS, Aeroplane Tie

Spranger Wire Wheel Co., Clayton Ave., Detroit, Mich.

RODS, ALUMINUM—See Aluminum, Sheet

RODS, Brake

(Brake Rods complete with yoke or eye rod ends to blue print or specification)

Jacobs Co., F. L., 449-53 Guoin St., Detroit, Mich. (See page 447.)
Michigan Electric Welding Plant, 514 Hart Ave., Detroit, Mich. (See page 400.)

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RODS, Brake (Continued)

Schweppe & Wilt Mfg. Co., Detroit, Mich. (See page 211.)

Standard Parts Co., Cleveland, O. (See pages 408 and 409.)

RODS, BRASS—See Brass, Sheet

RODS, Connecting

(Finished or Machined Rods: for connecting rods in the rough—See Forgings, Drop)

Billings & Spencer Co., Laurel & Park Sts., Hartford, Conn.

Bonney Vise & Tool Works, Allentown, Pa. (See page 293.)

Gill & Sons Forge & Machine Works, P. H., Lorraine & Otsego Sts., Brooklyn, N. Y. (See page 239.)

Layman Pressed Rod Co., 25 Broad St., New York, N. Y. "Pres-Tube."

Pres-Tube—See Layman Pressed Rod Co.

Standard Gauge Steel Co., Beaver Falls, Pa. (See page 341.)

Tindel-Morris Co., Eddystone, Pa.

RODS, COPPER—See Brass, Sheet

RODS, FIBRE—See Fibre, Hard

RODS, Gasoline Cock Control, for Fords

Sunderman Corp., 23 Chambers St., Newburgh, N. Y. (See page 151.)

RODS, PUSH—See Rods, Adjustable Valve

RODS, Radius, for Fords

(Auxiliary radius rods or braces for front axles)

Alford Motor & Machine Co., Ninth & Lincoln Sts., Goshen, Ind. "Biggs."

Apco Mfg. Co., Eddy St., Providence, R. I.

B B.—See Bayne Mfg. Co.

Badger Mfg. Corp., Milwaukee, Wis. (See page 139.)

Bayne Mfg. Co., Grant & Davis Sts., Bushnell, Ill. "B. B."

Bear Mfg. Co., E. 17th St. & First Ave., Rock Island, Ill.

Biggs—See Alford Motor & Machine Co.

Bridgers Co., J. D., Irby & Front Sts., Florence, S. C.

Chippewa Foundry & Machine Co., Chippewa Falls, Wis.

Cooper Auto Supply Co., N. Broad St., Thomasville, Ga.

Cox Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y.

Donlin Auto Co., C. A., Hopkins, Mo.

Dunham Co., Thos., Aurora, Ill. (See page 75.)

Gahm & McCormick Co., 802 E. Main St., Streator, Ill.

General Appliance Co., 19th St. & Western Ave., Chicago, Ill.

H & M—See Radius Rod Co.

Halls, A. S., Ortonville, Minn.

Hill-Smith Metal Goods Co., Dept. H., Boston, Mass. (See page 221.)

Hyway—See Staff & Eckhouse.

Illinois Brass Mfg. Co., 226-30 W. Ontario St., Chicago, Ill.

J. H. S.—See Sager Co.

Johnson & Co., J. F., Quanah, Tex.

Mazura Mfg. Co., 414 S. Sixth St., St. Louis, Mo.

Midway Mechanical Co., 1055 Selby Ave., St. Paul, Minn.

Modern Tool & Stamping Co., 311-17 S. Clinton St., Chicago, Ill.

Monnich-Gaylord Co., Hooper, Neb.

Motor Parts Machine Co., 645-49 S. Pierce St., Milwaukee, Wis.

Ostlind Bros., Ortonville, Minn.

Radius Rod Co., Lamoni, Ia. "H & M."

Sager Co., J. H., 36-38 S. Water St., Rochester, N. Y. "J. H. S."

Sieverkropp Engine Co., 1402 19th St., Racine, Wis. (See page 653.)

Spencer Metal Products Co., Spencer, O.

Staff & Eckhouse, 1432 S. Michigan Ave., Chicago, Ill. "Hyway." (See page 529.)

Standard Auto Accessory Co., 100 Mill St., Leipsic, O.

Star Specialty Mfg. Co., 227-33 W. Erie St., Chicago, Ill.

Vaughn-Harris Co., Vermilion, S. Dak.

Walker Mfg. Co., Hamilton & Michigan Sts., Racine, Wis.

Western Carburetor Co., Alma, Mich.

Wetco—See Wetherholt Co.

Wetherholt Co., 20 E. Jackson Blvd., Chicago, Ill. "Wetco."

RODS, Rear Axle Truss, for Fords

(For reinforcing or strengthening rear axle)

Advance Auto Specialty Mfg. Co., 10629 Garfield Ave., Cleveland, O. "Never-Slip."

Apco Mfg. Co., Eddy St., Providence, R. I.

Auto Parts Mfg. Co., 217 W. Seventh St., Sioux City, Ia.

Badger Mfg. Corp., Milwaukee, Wis. (See page 139.)

Edelmann & Co., E., 341-63 E. Ohio St., Chicago, Ill.

Eureka Parts Co., 328 Central Ave., Dunkirk, N. Y.

Excelsior Auto Parts Supply Co., 200 Cannon St., Bridgeport, Conn.

Gahm & McCormick Co., 802 E. Main St., Streator, Ill.

Goodrich-Lenhart Mfg. Co., 429 Widener Bldg., Philadelphia, Pa. (See page 111.)

H & M—See Radius Rod Co.

Humboldt Machine & Stamping Co., 31-35 Tenth St., Long Island City, N. Y.

Illinois Brass Mfg. Co., 226-30 W. Ontario St., Chicago, Ill.

Mazura Mfg. Co., 414 S. Sixth St., St. Louis, Mo.

Metal Stamping Co., 12th St. & Boulevard, Long Island City, N. Y.

Modern Tool & Stamping Co., 311-17 S. Clinton St., Chicago, Ill.

Motor Parts Machine Co., 645-49 S. Pierce St., Milwaukee, Wis.

Nelson Mfg. Co., A., 2700 Southport Ave., Chicago, Ill.

Never-Slip—See Advance Auto Specialty Mfg Co.

Radius Rod Co., Lamoni, Ia. "H & M."

Sager Co., J. H., 36-38 S. Water St., Rochester, N. Y.

Star Specialty Mfg. Co., 227-33 W. Erie St., Chicago, Ill.

Sunvold & Larson Mfg. Co., Sacred Heart, Minn.

Thompson Mfg. Co., 311 24th St., Des Moines, Ia.

Wetco—See Wetherholt Co.

Wetherholt Co., 20 E. Jackson Blvd., Chicago, Ill. "Wetco."

Worthington, A. P., 700 N. Main St., Los Angeles, Cal.

RODS, RUBBER—See Rubber, Hard

RODS, STEEL—See Steel

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RODS, STEERING—See Connections, Steering

RODS, STEERING, FOR FORDS—See Links, Steering

RODS, VALVE LIFT—See Rods, Adjustable Valve

RODS, Welding

Ideal Bronze Co., Cleveland, O. (See page 451.)

Trenton Smelting & Refining Co., Canal & Pearl Sts., Trenton, N. J.

ROLLER BEARINGS—See Bearings, Roller

ROLLER CHAINS—See Chains, Transmission

ROLLERS, Curtain

(For curtains in limousines or other closed cars)

Carey & Co., 246-48 N. Fifth St., Philadelphia, Pa. "Edw. Reukauf."

Cowles & Co., C., New Haven, Conn. (See page 339.)

Edw. Reukauf—See Carey & Co.

White Mfg. Co., 155 Cannon St., Bridgeport, Conn.

ROLLING MACHINES — See Machines, Fender Rolling

ROLLS, TOOL—See Bags, Tool

ROOMS, DRYING—See Rooms, Paint and Varnish Drying

ROOMS, Paint and Varnish Drying

Cutler Dry Kiln Co., 2464 Churchill St., Buffalo, N. Y.

Drying Systems, Inc., 322 N. Michigan Ave., Chicago, Ill. (See page 691.)

Perkins, Elmer E., 457-59 Monadnock Blk., Chicago, Ill.

Reliance Drying Room Co., 90 West St., New York, N. Y.

ROPE CLAMPS—See Clamps, Wire Rope

ROPE or CABLE, Bronze Wire

(For operating brakes or cut-outs)

Elephant—See Phosphor Bronze Smelting Co. **(See page 203.)**

Phosphor Bronze Smelting Co., 2200 Washington Ave., Philadelphia, Pa. "Elephant."

Reeves & Co., Paul S., 1415-25 Catherine St., Philadelphia, Pa.

Riverside Metal Co., Riverside, N. J. "Omega."

ROPE or CABLE, Steel Wire

(For operating brakes or cut-outs)

American Steel & Wire Co., Chicago, Ill. (See page 203.)

Atlas—See Fischer & Hayes Rope Co.

Broderick & Bascom Rope Co., 317 N. Second St., St. Louis, Mo.

Fischer & Hayes Rope Co., 602 W. Lake St., Chicago, Ill. "Atlas."

Hazard Mfg. Co., 31 E. Ross St., Wilkes-Barre, Pa.

Leschen & Sons Rope Co., A., 920 N. First St., St. Louis, Mo.

Macomber & Whyte Rope Co., 507-09 S. Clinton St., Chicago, Ill.

Roeblings Sons Co., John A., S. Broad & Canal Sts., Trenton, N. J.

Trenton Iron Co., Trenton, N. J.

Waterbury Co., 63 Park Row, New York, N. Y.

Wright Wire Co., Worcester, Mass. (See page 785.)

ROPES, CHAINS and BARS, Tow

American Steel & Wire Co., Chicago, Ill. (See page 203.)

Badger Mfg. Corp., Milwaukee, Wis. (See page 139.)

Basline Autowline—See Broderick & Bascom Rope Co.

Broderick & Bascom Rope Co., 317 N. Second St., St. Louis, Mo. "Basline Autowline."

Cleveland Chain & Mfg. Co., Cleveland, O.

Dyer Co., G. H., Cambridge, Mass. (See page 505.)

Excelsior—See Wright Wire Co.

Hercules—See Leschen & Sons Rope Co.

Hogarty, Edward, Unionville, Conn. "Utility."

Krein Chain Co., Wapakoneta, O.

Leschen & Sons Rope Co., A., 920 N. First St., St. Louis, Mo. "Hercules."

Rochester Rope Goods Co., 320 Florida St., Milwaukee, Wis.

U. W.—See Upson-Walton Co.

Upson-Walton Co., 1310 W. 11th St., Cleveland, O. "U. W."

Utility—See Hogarty, Edward.

Wright Wire Co., Worcester, Mass. "Excelsior." (See page 785.)

ROTARY SHEARS—See Shears, Rotary

ROTATORS, Valve

"Ceco"—See Continental Engineering Corp.

Continental Engineering Corp., Omaha, Neb. "Ceco." (See page 487.)

ROUGH STUFF—See Fillers, Paint

RUBBER BATTERY JARS—See Jars, Rubber Battery

RUBBER BUCKETS—See Buckets, Collapsible

RUBBER BUMPERS—See Bumpers, Rubber Spring

RUBBER CEMENT—See Cement, Tire; also Tubing, Soft Rubber

RUBBER COATED CLOTH—See Cloth, Rubber Coated

RUBBER CONNECTORS—See Tubing, Soft Rubber

RUBBER CORD, AEROPLANE—See Cord, Aeroplane Rubber

RUBBER CUTTING KNIVES—See Knives, Tire Repair

RUBBER FUSELAGE WIRE PROTECTORS, AEROPLANE—See Protectors, Aeroplane Fuselage Wire

RUBBER GAS BAGS—See Bags, Rubber Gas

RUBBER GASKETS—See Packing

RUBBER GLOVES—See Gloves, Rubber

RUBBER GRIPS, AEROPLANE—See Grips, Aeroplane Rubber

RUBBER HAMMERS—See Mallets, Rubber

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RUBBER, Hard

(Sheet, Rod and Tube)

American Hard Rubber Co., 9 Mercer St., New York, N. Y.
Luzerne Rubber Co., Trenton, N. J.
Siemon Hard Rubber Co., Bridgeport, Conn.
Stokes Rubber Co., Jos., Trenton, N. J.
Vulcanized Rubber Co., 251 Fourth Ave., New York, N. Y.

RUBBER HORN BULBS—See Bulbs, Rubber Horn

RUBBER HOSE—See Hose, Rubber

RUBBER MALLETS—See Mallets, Rubber

RUBBER MATTING—See Mats, Rubber

RUBBER MATS—See Mats, Rubber

RUBBER PACKING—See Packing, Rubber

RUBBER PAINTS—See Paints, Rubber

RUBBER PATCHES—See Patches, Tire Repair

RUBBER PLUGS—See Plugs, Tire Repair

RUBBER PRESERVATIVES — See Compounds, Tire Preserving

RUBBER PUTTY—See Compounds, Tire Repair

RUBBER RADIATOR CAPS—See Caps, Rubber Radiator

RUBBER ROD—See Rubber, Hard

RUBBER SHEET—See Rubber, Hard

RUBBER SPRING BUMPERS—See Bumpers, Rubber

RUBBER TESTING INSTRUMENTS—See Instruments, Rubber and Felt Testing

RUBBER TIRES—See Tires

RUBBER TUBING—See Tubing, Soft Rubber

RUBBER WIRE STREAMLINING, AEROPLANE—See Streamlining, Aeroplane Rubber Wire

RUBBERS, TIRE PUMP CONNECTION—See Washers, Tire Pump

RUNNING BOARD BRACES FOR FORDS —See Braces

RUNNING BOARD MATS—See Mats, Step or Running Board

RUNNING BOARD MOULDING — See Moulding

RUNNING BOARD PLATES—See Plates, Heel, Pedal or Step

RUNNING BOARDS—See Boards, Running

RUNNING GEAR ALIGNERS—See Gages, Wheel Aligning

RUNNING GEARS—See Chassis, Complete

RUST PREVENTING COMPOUNDS — See Compounds, Rust Preventing

RUST PROOFING—See Galvanizing

RUST REMOVING COMPOUNDS — See Compounds, Rust Preventing

S-WRENCHES—See Wrenches, Nut and Bolt

SADDLES, Motorcycle

Mesinger Mfg. Co., H. & F., Austin Pl. & E. 144th St., New York, N. Y.
Superior Metal Products Co., Elyria, O.

SAFETY BUCKLES, AIRCRAFT — See Buckles, Aircraft Safety

SAFETY STARTING CRANKS — See Cranks, Safety

SAFETY TOW HOOKS—See Hooks, Safety Tow

SAFETY VALVES—See Valves, Safety

SALTS, SOLDERING—See Flux, Soldering

SAND BOXES—See Boxes, Sand

SAND CLOTH—See Paper, Emery and Sand

SAND PAPER—See Paper, Emery and Sand

SANDERS, ROAD—See Boxes, Sand

SAVERS, BATTERY—See Cut-Outs, Automatic Ignition

SAVERS, GASOLINE—See Mixers, Fuel

SAW BLADES—See Blades, Hack Saw

SAWS, Band

Woodworkers Tool Works, 230 S. Clinton St., Chicago, Ill. (See page 723.)

SAWS, Cold

Earle Gear & Machine Co., 4705 Stenton Ave. (Wayne Jct.), Philadelphia, Pa. "Lea Simplex." (See page 339.)
Lea Simplex—See Earle Gear & Machine Co.

SAWS, HACK—See Frames, Hack Saw; also Blades, Hack Saw

SCORED CYLINDERS, REPAIRING OF—See Cylinders, Scored, Repairing of

SCRAPERS, Bearing

Alert Tool Co., 237 N. Sixth St., Philadelphia, Pa.
Braunsdorf-Mueller Co., 205 Madison St., Elizabeth, N. J.
Buffum Tool Co., Louisiana, Mo. (See page 707.)
Hayes File Co., 474-78 Franklin St., Detroit, Mich.
Kraeuter & Co., 571-85 18th Ave., Newark, N. J.
Lutz—See Western Tool & Mfg. Co.
Mound Tool Co., Dept. D., Seventh & Hickory Sts., St. Louis, Mo. (See page 789.)
Osborne & Co., C. S., Harrison, N. J.
Stortz & Son, John, 2010-12 Vine St., Philadelphia, Pa.
Vlchek Tool Co., 10709 Quincy Ave., Cleveland, O.
Western Tool & Mfg. Co., Springfield, O. "Lutz."

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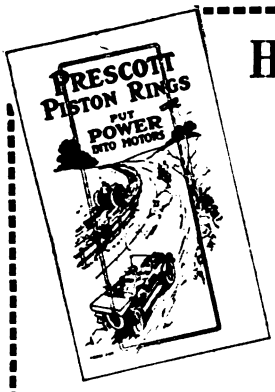

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SCRAPERS, Carbon

Braunsdorf-Mueller Co., 205 Madison St., Elizabeth, N. J.

Buffum Tool Co., Louisiana, Mo. (See page 707.)

Chapman Bros. Co., Saybrook, Conn. "Saybrook."

Flexible Carbon Scraper Co., 1421 W. Washington St., Los Angeles, Cal. (See page 625.)

Ideal Valve Grinder Co., 1478 W. 22nd St., Los Angeles, Cal. "Little Dandy."

Little Dandy—See Ideal Valve Grinder Co.

Marcy Tool Works, Putnam, Conn.

Mound Tool Co., Dept. D., Seventh & Hickory Sts., St. Louis, Mo. (See page 789.)

Nelson Mfg. Co., A., 2700 Southport Ave., Chicago, Ill.

Osborne & Co., C. S., Harrison, N. J.

Saybrook—See Chapman Bros Co.

SCRAPERS, Foot

(For attachment to running board for scraping dirt or mud from the feet before entering car; for running board mats—See Mats, Running Board)

Bihler, Albert E., 1114-18 Dodge St., Omaha, Neb.

Mazura Mfg. Co., 414 S. Sixth St., St. Louis, Mo.

National Motor Supply Co., Painesville, O.

SCREENS, Horn

(Wire cloth screens to cover the mouth of horns to prevent dirt or stones entering and clogging the reed or diaphragm)

Standard Metal Mfg. Co., 287 Chestnut St., Newark, N. J.

SCREENS, Wire Windshield

Webb Auto Screen Co., Brainerd, Minn.

SCREW CASES—See Cases, Bolt

SCREW CUTTING DIES—See Taps and Dies

SCREW DRIVERS—See Drivers, Screw

SCREW DRIVING MACHINES—See Machines, Screw Driving

SCREW-EYES, Brass and Iron

Brooks & Sons, M. S., Chester, Conn.

Jenckes Mfg. Co., E., 28 Union St., Worcester, Mass.

Sargent & Co., Water & Wallace Sts., New Haven, Conn.

Wire Goods Co., 28 Union St., Worcester, Mass.

SCREW MACHINE CHUCKS—See Chucks, Screw Machine

SCREW Machine Products to Order

A C R—See American Cloth Register Co.

Acme Mfg. Co., Boonton, N. J.

Akron-Selle Co., High & Chestnut Sts., Akron, O.

Albaugh Dover Co., 2100 Marshall Blvd., Chicago, Ill. (See page 327.)

American Ball Co., 115 Clifford St., Providence, R. I.

American Brass Novelty Co., Grand Haven, Mich.

American Cloth Register Co., 189 Main St., New Britain, Conn. "A C R."

American Die & Tool Co., Reading, Pa. (See page 317.)

American Steam Gauge & Valve Mfg. Co., 208-20 Camden St., Boston, Mass.

Ashley Machine Works, 724 University Ave., Rochester, N. Y.

Atlas Bolt & Screw Co., 1289 Marquette Rd., N. E., Cleveland, O.

Atlas Brass Foundry Co., Columbus, O. (See page 530.)

Attwood Brass Works, Grand Rapids, Mich. (See page 531.)

Automatic Products Co., 1145 W. Grand Blvd., Detroit, Mich. (See page 593.)

Babson-Dow Mfg. Co., 60 Fulda St. (Roxbury), Boston, Mass.

Bailey Co., Geo. D., 4500 Ravenswood Ave., Chicago, Ill.

Ball & Roller Bearing Co., 22 Maple Ave., Danbury, Conn.

Bard Mfg. Co., 582 Main St., Waltham, Mass.

Barkelew Metal Products Co., 131 E. Second St., Dayton, O.

Barnes Co., Wallace, Wallace & Parallel Sts., Bristol, Conn.

Belvidere Screw & Machine Co., Belvidere, Ill.

Bilton Machine Tool Co., 990 Housatonic Ave., Bridgeport, Conn.

Blair Tool & Machine Works, 521 Greenwich St., New York, N. Y.

Blake & Johnson Co., Waterbury, Conn.

Brown Bag Filling Machine Co., 10 Main St., Fitchburg, Mass.

Brown-McLaren Mfg. Co., 1523 W. Fort St., Detroit, Mich.

Cassady-Fairbank Mfg. Co., 6106-20 La Salle St., Chicago, Ill.

Central Machine Works, 12th & Tyler Sts., St. Louis, Mo.

Chicago Automatic Machine Co., 400-08 N. Oakley Blvd., Chicago, Ill.

Chicago-Racine Aluminum, Brass & Iron Works, 224-30 W. Huron St., Chicago, Ill.

Chicago Screw Co., Homan Ave. & Fillmore St., Chicago, Ill. (See pages 593 and 601.)

Cincinnati Ball Crank Co. (Oakley), Cincinnati, O. (See page 353.)

Cincinnati Screw Co., Twightwee, O.

City Iron Works & Machine Co., 520 S. Delaware Ave., Philadelphia, Pa.

Clark-Cadle-Harmon Corp., 1139 University Ave., Rochester, N. Y.

Cleveland Wrought Products Co., 3590 W. 58th St., Cleveland, O.

Commonwealth Brass Corp., Commonwealth Ave. & Grand Trunk Ry., Detroit, Mich.

Commonwealth Screw Co., Worcester, Mass.

Consolidated Machine Co., Farwell Bldg., Detroit, Mich.

Corbin Screw Corp., High St., New Britain, Conn.

Cornwall & Patterson Mfg. Co., Bradford & Fairfield Aves., Bridgeport, Conn.

Crittenden Mfg. Co., Boston, Mass.

Curtis Screw Works, 17 Gull St., Buffalo, N. Y.

Dallett Co., Thos. H., 1301 Federal St., Philadelphia, Pa.

Davis Sewing Machine Co., Linden & Davis Sts., Dayton, O.

Detroit Screw Works, 368 Franklin St., Detroit, Mich.

Eastern Machine Screw Corp., Barclay & Truman Sts., New Haven, Conn.

Eclipse Mfg. Co., 424 N. Meridian St., Indianapolis, Ind.

Empire Mfg. Co., 180-82 Emmett St., Newark, N. J.

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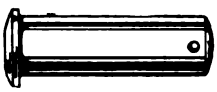

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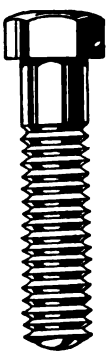

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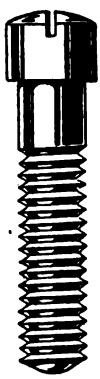

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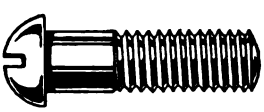
SCREW MACHINE PRODUCTS

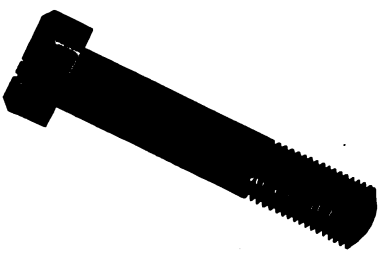
WE SPECIALIZE IN CAPSCREWS
MILLED FROM STEEL BARS

Send Your Prints For Estimates



Attractive Deliveries

Set Screws
Cap Screws
Studs
Taper Pins
Semi-Fin Nuts
Castle Nuts



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Gear Blanks
Clevis Pins
Conn Rod Bolts
Spring Shackle Bolts
Valve Lifters
Valve Rollers
Idler Studs

THE CHICAGO SCREW CO.
Est. 1872
Homan Ave. & Fillmore St.
CHICAGO, ILL.

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SCREW Machine Products to Order (Continued)

Enterprise Mfg. Co., Ash & Main Sts., Akron, O.

Ericsson Screw Machine Products Co., 601 Bergen St., Brooklyn, N. Y.

Erie Metal Products Co., Erie, Pa. (See page 523.)

Erie Specialty Co., 510 W. 12th St., Erie, Pa.

Faries Mfg. Co., Decatur, Ill.

Fernald Mfg. Co., North East, Pa.

Ferry Cap & Set Screw Co., 2155 Scranton Rd., Cleveland, O. (See page 595.)

Fischer Special Mfg. Co., 2076-78 Reading Rd., Cincinnati, O.

Garvin Machine Co., Spring & Varick Sts., New York, N. Y.

General Machine Works, Lamour & Prospect Sts., York, Pa.

Giant Motor Co., 28 Calumet St., Newark, N. J.

Gleason-Peters Air Pump Co., 384 Classon Ave., Brooklyn, N. Y.

Greer, Frederic, 525 W. Van Buren St., Chicago, Ill.

Gwynn Engineering Co., 100 Liberty Ave., Pittsburgh, Pa.

Hancock Mfg. Co., 770 Henry St., Charlotte, Mich.

Hanson Bros., 538-48 Southington Ave., Plainville, Conn.

Harding & Co., 122 S. Michigan Ave., Chicago, Ill. (See page 261.)

Hartford Machine Screw Co., Hartford, Conn. (See page 513.)

Higginson-Gibson Mfg. Co., 74 Atlantic St., Boston, Mass.

Hill Co., Geo. Q., 32-34 Dorchester Ave., Boston, Mass.

Hill Pump Valve Co. See Zinke Co.

Hubbell, Harvey, State St. & Bostwick Ave., Bridgeport, Conn.

Imperial Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill. (See page 733.)

Indianapolis Tool & Mfg. Co., Indianapolis, Ind. (See page 335.)

Inter-State Machine Products Co., Rochester, N. Y.

Keeler Brass Co., 261-71 Godfrey Ave., Grand Rapids, Mich.

Keyless Lock Co., 1401 Newman St., Indianapolis, Ind.

Krahn Mfg. Co., 588 Clinton St., Milwaukee, Wis.

Lawrie Co., Fred'k S., Odd Fellows Bldg., Indianapolis, Ind. (Sales Agents.) (See page 867.)

McCully, R. P. & C. H., 331-35 Van Buren St., Brooklyn, N. Y.

McKenna Brass & Mfg. Co., First Ave. & Ross St., Pittsburgh, Pa. (See page 481.)

McPhee & Phillips Co., 1148 N. Hoyne St., Chicago, Ill.

Machine Parts Co., Pine & Cedar Sts., Elyria, O.

Mann Corp., Kankakee, Ill.

Meisel Press Mfg. Co., 945 Dorchester Ave., Boston, Mass. (See page 319.)

Michigan Screw Co., Lansing, Mich.

Milholland Machine Co., W. K., Tenth & Canal Sts., Indianapolis, Ind.

Milwaukee Separator Mfg. Co., 247 Madison St., Milwaukee, Wis.

Modern Tool & Stamping Co., 311-17 S. Clinton St., Chicago, Ill.

Moesta & Ruehrwein, Hulbert Blk., Cincinnati, O.

Morgan Mfg. Co., Keene, N. H.

Mossberg Co., Frank, Attleboro, Mass. (See page 769.)

National Acme Co., Cleveland, O. (See page 553.)

National Engineering Co., Liberty Bldg., Philadelphia, Pa.

National Machine Products Co., Bellevue & Warren Sts., Detroit, Mich.

National Sewing Machine Co., Belvidere, Ill.

Nelson Mfg. Co., A., 2700 Southport Ave., Chicago, Ill.

New Britain Machine Co., 10 Bigelow St., New Britain, Conn. (See page 659.)

New Haven Screw Co., 191-93 Foster St., New Haven, Conn.

New Home Sewing Machine Co., Orange, Mass.

Ohio Metal Products Co., 35-39 Edgar St., Dayton, O.

Olson Mfg. Co., 54 Commercial St., Worcester, Mass.

Ontario Machine Screw Co., 3415 Roher St., Philadelphia, Pa.

Osborne & Stephenson Mfg. Co., Plainville, Conn.

Otto Metal Goods Corp., Wm. H., 401-07 St. Paul's Ave., Jersey City, N. J.

Parker White-Metal & Machine Co., 23rd & Railroad Sts., Erie, Pa. (See page 655.)

Parsons Mfg. Co., Detroit, Mich.

Peck & Young Mfg. Co., Forestville, Conn.

Peerless Automatic Machine Co., 1970 W. 77th St., Cleveland, O.

Peninsular Milled Screw Co., 1090 Lafayette St., E., Detroit, Mich.

Perry-Fay Mfg. Co., Elyria, O.

Philadelphia Machine Screw Works, 624-26 Race St., Philadelphia, Pa.

Phillips Mfg. Co., R. B., Worcester, Mass.

Precision Machine Co., 1029 Superior St., Indianapolis, Ind.

Racine Screw Works, 1501 Clark St., Racine, Wis.

Ramsdell Specialty Co., W. Boylston St., Worcester, Mass.

Raymond Engineering Corp., 305 Lafayette St., New York, N. Y.

Reed & Prince Mfg. Co., Duncan Ave., Worcester, Mass.

Reese Machine & Tool Works, S., 224-30 W. Main St., Plymouth, Pa.

Rhode Island Tool Co., Providence, R. I.

Reliable Machine Co., 5320 St. Clair Ave., N. E., Cleveland, O.

Reliance Engineering Co., Lansing, Mich.

Ross Machine Co., 208 S. Fourth St., Lafayette, Ind.

Rothweiler & Co., First & Hanford Sts., Seattle, Wash.

S. A. Machine Co., Detroit, Mich. (See page 429.)

St. Louis Screw Co., Clarence & Bulwer Aves., St. Louis, Mo.

Sandow Tool Co., 570-76 W. Broadway, New York, N. Y.

Saxon Mfg. Co., 1034-40 Grand Ave., Toledo, O.

Schloemer Mfg. Co., 388-92 Division St., Oshkosh, Wis.

Scovill Mfg. Co., Waterbury, Conn. (See page 659.)

Screw Machine Products Corp., 1012 Eddy St., Providence, R. I.

Sears-Cross Co., Bush Terminal, Brooklyn, N. Y.

Service Gear & Machine Co., Second & Buttonwood Sts., Reading, Pa.

Sherman-Klove Co., 4519 W. Harrison St., Chicago, Ill. (See page 603.)

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BECAUSE

in gruelling war zone service and in intensive industrial work here at home, they are standing up under service harder than your trade can give them.

You are authorized to sell Reflex Plugs on a money back guarantee. They net you an exceptional profit. Write today for particulars.

THE REFLEX IGNITION CO.

1710 Payne Ave., Cleveland, U. S. A.

Hand Scraping of Bearings Eliminated

in many cases—in others a saving of 50% to 95% is effected by use of

Martell
Aligning Reamer

For new work or repair work on all makes of motors. Used by the largest motor car and truck manufacturers of the country.

Insures:

1. Perfect alignment of all bearings.
2. Correct position of Crankshaft with reference to centers of camshaft, driving gear and pinion.
3. Correct size of bore of bearings, allowing for oil clearance.

Write for our Repair Reamer Catalogue

TAFT-PEIRCE
Woonsocket, R.I., U.S.A.

New York Woolworth Bldg. — Detroit Majestic Bldg.

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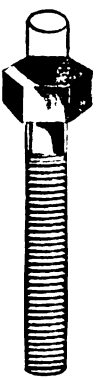
Saving Steel
on Cap and Set Screws



The Ferry Way

- Cap Screws
- Set Screws
- Milled Studs
- Taper Pins
- Clevis Pins
- Stove Door Pins
- Spring and Shackle Bolts
- Connecting Rod Bolts
- Screw Machine Products

Ferry patented tools and processes make screws from *round stock only as thick as the shank of the screw.*

Thus Ferry methods save steel and cut costs.

Your inspection department is no more critical than our own. Accuracy, economy, speed and satisfaction go hand in hand with Ferry products.

Send blue prints, specifications or samples for our quotations on special work.

We have many sizes of standard cap and set screws in U. S. S. and A. L. A. M. threads ready to ship. May we send you a catalog?

The Ferry Cap and Set Screw Co.

2155 SCRANTON ROAD, CLEVELAND, O.

Specialists of High Reputation in Screw Machine Products

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SCREW Machine Products to Order (Continued)

Smith Mfg. Co., F. H., 3037 Carroll Ave., Chicago, Ill.

Snow-Dole-Richards Co., 9-15 Murray St., New York, N. Y.

Spacke Machine & Tool Co., Indianapolis, Ind. (See page 427.)

Spafford Machine Screw Works, 586 Asylum St., Hartford, Conn.

Spencer's Sons, I. S., Guilford, Conn.

Standard Separator Co., Milwaukee, Wis.

Steele & Johnson Mfg. Co., 779 S. Main St., Waterbury, Conn.

Steger & Sons Industrial Works, Steger, Ill.

Thomaston Mfg. Co., Thomaston, Conn.

Toledo Screw Products Co., 2238 Amead Ave., Toledo, O.

Torrington Mfg. Co., Torrington, Conn.

Union Cap Screw Co., Detroit, Mich.

U. S. Automatic Co., Amherst, O.

Up-To-Date Machine Works, 2913-15 S. Wabash Ave., Chicago, Ill.

Villinger Mfg. Co., 643 Elmira Ave., Williamsport, Pa.

Voelkner & Harry Mfg. Co., 282-92 Woodbridge St. E., Detroit, Mich.

Ware Bros., 224 N. Ada St., Chicago, Ill.

Waterbury Mfg. Co., 568 Main St., Waterbury, Conn.

Watkins Co., D. M., 95 Pine St., Providence, R. I.

Wellman Pattern-Supply Co., 1444 E. 49th St., Cleveland, O.

Western Automatic Machine Screw Co., 750 Lake Ave., Elyria, O.

Western Brass Mfg. Works, Marshall Blvd., 21st St. & C. B. & Q. R. R., Chicago, Ill.

Western Screw-Products Co., St. Louis, Mo. (See page 593.)

Wheeler & Son, Frank, 55 Stone St., Meriden, Conn.

Wicaco Screw & Machine Works, Seventh & Wood Sts., Philadelphia, Pa.

Wolverine Brass Works, Grand Rapids, Mich.

Worcester Machine Screw Co., 79 Beacon St., Worcester, Mass.

Zinke Co., 1323-25 Michigan Ave., Chicago, Ill. (Sole Distributors for Hill Pump Valve Co., Chicago, Ill.) (See page 551.)

SCREW MACHINES—See Machines, Screw

SCREW PITCH GAGES—See Gages, Screw Pitch

SCREW PLATES—See Taps and Dies

SCREWS, Cap and Set

Allen Mfg. Co., 135 Sheldon St., Hartford, Conn.

Atlas Bolt & Screw Co., 1289 Marquette Rd., N. E., Cleveland, O.

Automatic Products Co., 1145 W. Grand Blvd., Detroit, Mich. (See page 593.)

Barkelew Metals Products Co., 131 E. Second St., Dayton, O.

Bristol Co., Waterbury, Conn.

Chicago Screw Co., Homan Ave. & Fillmore St., Chicago, Ill. (See pages 593 and 601.)

Cincinnati Screw Co., Twightwee, O.

Clark Bros. Bolt Co., Milldale, Conn.

Cleveland Wrought Products Co., 3590 W. 58th St., Cleveland, O.

Columbus Bolt Works Co., Columbus, O. (See page 187.)

Corbin Screw Corp., High St., New Britain, Conn.

Crittenden Mfg. Co., Boston, Mass.

Curtis Screw Works, 17 Gull St., Buffalo, N. Y.

Detroit Bolt & Hardware Co., 45-49 Adelaide St., Detroit, Mich.

Detroit Screw Works, 368 Franklin St., Detroit, Mich.

Eastern Machine Screw Corp., Barclay & Truman Sts., New Haven, Conn.

Ferry Cap & Set Screw Co., 2155 Scranton Rd., Cleveland, O. (See page 593.)

Foster—See New Haven Screw Co.

Hartford Machine Screw Co., Hartford, Conn. (See page 513.)

Haskell Mfg. Co., Wm. H., 24 Commerce St., Pawtucket, R. I.

Mac-It Parts Co., Manheim Pike, Lancaster, Pa.

Muncie Cap & Set Screw Co., Willard St. & Hoyt Ave., Muncie, Ind.

National Acme Co., Cleveland, O. (See page 477.)

National Lock Co., Rockford, Ill. (See page 599.)

New Haven Screw Co., 191-93 Foster St., New Haven, Conn. "Foster."

Pawtucket Mfg. Co., 327 Pine St., Pawtucket, R. I.

Peninsular Milled Screw Co., 1090 Lafayette St. E., Detroit, Mich.

Phillips Mfg. Co., R. B., Worcester, Mass.

Pittsburgh Screw & Bolt Co., Preble Ave., (N. S.), Pittsburgh, Pa.

Reed & Prince Mfg. Co., Duncan Ave., Worcester, Mass.

Rhode Island Tool Co., Providence, R. I.

Rochester Machine Screw Co., 15 Caledonia St., Rochester, N. Y.

Russell & Erwin Mfg. Co., New Britain, Conn.

St. Louis Screw Co., Clarence & Bulwer Aves., St. Louis, Mo.

Scovill Mfg. Co., Waterbury, Conn. (See page 659.)

Sherman-Klove Co., 4519 W. Harrison St., Chicago, Ill. (See page 603.)

Shimer & Sons, Samuel J., Milton, Pa.

Toledo Screw Products Co., 2238 Smead Ave., Toledo, O.

Union Cap Screw Co., Detroit, Mich.

Upson Nut Co., Unionville, Conn.

Victor Screw Works, 240 John R. St., Detroit, Mich.

Western Automatic Machine Screw Co., 750 Lake Ave., Elyria, O. (See page 475.)

Western Screw-Products Co., St. Louis, Mo. (See page 593.)

Worcester Machine Screw Co., 79 Beacon St., Worcester, Mass.

SCREWS, Coach and Lag

American Iron & Steel Mfg. Co., Front & Cumberland Sts., Lebanon, Pa.

Clark Bros. Bolt Co., Milldale, Conn.

Haskell Mfg. Co., Wm. H., 24 Commerce St., Pawtucket, R. I.

Lamson & Sessions Co., 2188 Scranton Rd., Cleveland, O.

National Screw & Tack Co., Cleveland, O. (See page 477.)

Oliver Iron & Steel Co., Pittsburgh, Pa.

Pawtucket Mfg. Co., 327 Pine St., Pawtucket, R. I.

Republic Iron & Steel Co., Republic Bldg., Youngstown, O.

Upson Nut Co., Scranton Rd., Cleveland, O.

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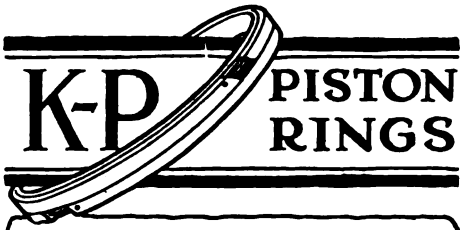

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ACCURATE
RESILIENT
UNIT CONSTRUCTION
PERFECT COMPRESSION

K-P Rings are the three-piece rings with the side lock and groove which hold the pieces together as one unit.

They *fit*. They bear equally on every point of the cylinder wall. They can't leak. That means

MORE POWER

Stock them. Recommend them. Make satisfied customers. Send for booklet "Economy and Power." It tells why.

Keys Piston Ring Co.
3020. Olive St., St. Louis, Mo.

UNITED STATES PISTON RING CO.

have opened up a branch factory in Cleveland, Ohio, where they will manufacture their individually cast improved patented concentric hammered piston rings. These rings are guaranteed to give more strength and mileage to your engine. Because of its perfect fit and uniform expansion it is possible to obtain these results. Due to the improved patented method of machine hammering the necessary uniform tension is obtained, leaving the molecules of iron free to expand uniformly. A trial will prove the superiority of these rings. Write for booklet and price, stating quantities.

United States Piston Ring Co.
2108 Superior Avenue, N. W.
CLEVELAND, OHIO

ALLISON
WELDLESS RINGS

ALLISON
TRADE MARK REGISTERED

for Ball Bearings
and
All Special Purposes
30 Years' Experience

New Equipment Now Ready

ALLISON AND COMPANY
CHESTER·PA·

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SCREWS, LAG—See Screws, Coach and Lag

SCREWS, Machine

American Screw Co., 21 Stevens St., Providence, R. I.

Atlas Bolt & Screw Co., 1289 Marquette Rd., Cleveland, O.

Blake & Johnson Co., Waterbury, Conn.

Cincinnati Screw Co., Twightwee, O.

Corbin Screw Corp., High St., New Britain, Conn.

Detroit Bolt & Hardware Co., 45-49 Adelaide St., Detroit, Mich.

Hartford Machine Screw Co., Hartford, Conn. (See page 513.)

National Acme Co., Cleveland, O. (See page 477.)

National Lock Co., Rockford, Ill. (See page 599.)

National Screw & Tack Co., Cleveland, O. (See page 477.)

New Haven Screw Co., 191-93 Foster St., New Haven, Conn.

Progressive Mfg. Co., Torrington, Conn.

Ramsdell Specialty Co., W. Boylston St., Worcester, Mass.

Reed & Prince Mfg. Co., Duncan Ave., Worcester, Mass.

Russell & Erwin Mfg. Co., New Britain, Conn.

St. Louis Screw Co., Clarence & Bulwer Aves., St. Louis, Mo.

Scovill Mfg. Co., Waterbury, Conn. (See page 659.)

Steele & Johnson Mfg. Co., 770 S. Main St., Waterbury, Conn.

U. S. Automatic Co., Amherst, O.

Western Automatic Machine Screw Co., 750 Lake Ave., Elyria, O. (See page 475.)

Worcester Machine Screw Co., 79 Beacon St., Worcester, Mass.

SCREWS, SET—See Screws, Cap and Set

SCREWS, Thumb

Billings & Spencer Co., Laurel & Park Sts., Hartford, Conn.

Chicago Screw Co., Homan Ave. & Fillmore St., Chicago, Ill. (See pages 593 and 601.)

Devlin Mfg. Co., Thos., Third & Lehigh Aves., Philadelphia, Pa.

Eberhard Mfg. Co., 2734 Tennyson Rd., Cleveland, O.

Haskell Mfg. Co., Wm. H., 24 Commerce St., Pawtucket, R. I.

Peninsular Milled Screw Co., 1090 Lafayette St. E., Detroit, Mich.

Rochester Machine Screw Co., 15 Caledonia St., Rochester, N. Y.

St. Louis Screw Co., Clarence & Bulwer Aves., St. Louis, Mo.

Screw Machine Products Corp., 1012 Eddy St., Providence, R. I.

Steele & Johnson Mfg. Co., 779 S. Main St., Waterbury, Conn.

Western Automatic Machine Screw Co., 750 Lake Ave., Elyria, O. (See page 475.)

SCREWS, Wood

American Screw Co., 21 Stevens St., Providence, R. I.

Atlantic Screw Works, Charter Oak Ave., Hartford, Conn.

Bridgeport Screw Co., Bridgeport, Conn.

Continental Wood Screw Co., New Bedford, Mass.

Corbin Screw Corp., High St., New Britain, Conn.

Federal Screw Corp., 393 Harris Ave., Providence, R. I.

National Lock Co., Rockford, Ill. (See page 599.)

National Screw & Tack Co., Cleveland, O. (See page 477.)

Reed & Prince Mfg. Co., Duncan Ave., Worcester, Mass.

Russell & Erwin Mfg. Co., New Britain, Conn.

SEALING COMPOUNDS—See Compounds, Puncture Sealing

SEAMING CORD—See Cord, Seaming

SEARCHLIGHTS, ACETYLENE — See Lamps, Acetylene; also Headlights, Tractor Acetylene

SEARCHLIGHTS, ELECTRIC — See Headlights, Electric; also Lights, Spot

SEARCHLIGHTS, SWIVEL ELECTRIC—See Lights, Spot

SEAT BACKS—See Backs, Metal Seat; also Bendings, Wood

SEAT BENDINGS—See Bendings, Wood

SEAT COVERS—See Covers, Slip

SEAT CUSHIONS—See Cushions, Seat

SEATING MACHINES — See Machines, Valve Seating and Grinding

SEAT STARTERS—See Starters

SEATS, Supplementary

(Auxiliary or Supplementary Seats including folding chairs and stools)

American Auto Top Companies, 2 Hudson St., New York, N. Y. "Victor."

Amesbury Brass & Foundry Co., Amesbury, Mass.

Buffington & Co., C. A., Berkshire, N. Y.

Defiance Welding Co., Defiance Bldg., Defiance, O.

Empire Gear & Top Co., 207 N. 22d St., Philadelphia, Pa.

Hill Mfg. Co., 25-27 Fuller St., Buffalo, N. Y.

Hodge & Graves Co., Amesbury, Mass. "Luxury." (See page 271.)

Ideal—See Metal Stamping Co.

Ideal Brass Works, 560 N. Elder Ave., Indianapolis, Ind.

Imperial Bit & Snap Co., 14th & Clark Sts., Racine, Wis.

Jitney—See Metal Stamping Co.

Kimball & Co., C. P., Chicago, Ill. (See page 137.)

Luxury—See Hodge & Graves Co.

McKinnon Dash Co., 252 Amherst St., Buffalo, N. Y. (See page 663.)

Metal Stamping Co., 13th St. & Boulevard, Long Island City, N. Y. "Ideal," "Peerless," "Jitney."

Peerless—See Metal Stamping Co.

Polson Mfg. Co., 1754 Main St., Buffalo, N. Y.

Victor—See American Auto Top Companies.

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STEEL CAP SCREWS

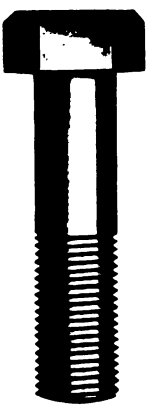
STANDARD AND S. A. E.

CUT THREAD

IN STOCK FOR IMMEDIATE SHIPMENT

ALSO

FLAT HEAD CAP
FILLISTER HEAD CAP
MACHINE SCREWS
WOOD SCREWS
STOVE BOLTS
STUD BOLTS
CARRIAGE BOLTS
U. S. S. AND S. A. E.
PLAIN AND CASTLE
SEMI FINISHED HEXAGON NUTS
WIRE NAILS
WIRE GOODS



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QUALITY, ACCURACY AND SERVICE ASSURED

WE INVITE YOUR INQUIRIES

National Lock Co.

ROCKFORD *BRANCH SALES OFFICES* ILLINOIS

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DETROIT, MICH.
HIGH POINT, N. C.
JAMESTOWN, N. Y.
CINCINNATI, O.
GRAND RAPIDS, MICH.
SEATTLE, WASH.
KITCHENER, ONT.

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SEATS, Supplementary, for Fords

(For attaching to inside of tonneau doors)

McKinnon Dash Co., 252 Amherst St., Buffalo, N. Y. (See page 603.)

SEATS and Attachments, Motorcycle Tandem

Fentress-Newton Mfg. Co., Detroit, Mich.
G-N—See Fentress-Newton Mfg. Co.

SECONDARY WIRE—See Wire, Insulated

SEGAR LIGHTERS—See Lighters, Electric Cigar

SELF-FLUXING SOLDER — See Flux, Soldering; also Solder, Bar and Wire

SENSITIVE DRILLS—See Drills, Sensitive

SEPARATING TOOLS—See Tools, Spring Leaf Separating

SEPARATORS, Bow

(See also Holders, Top)

American Brass Novelty Co., Grand Haven, Mich.
Amesbury Brass & Foundry Co., Amesbury, Mass.
Anchor—See North & Judd Mfg. Co.
Attwood Brass Works, Grand Rapids, Mich. (See page 531.)
Auto Specialties Mfg. Co., St. Joseph, Mich. (See page 193.)
Bair—See Auto Specialties Mfg. Co.
Desoco—See Detroit Socket Co.
Detroit Socket Co., 814 Jefferson Ave., W., Detroit, Mich. "Desoco."
Eberhard Mfg. Co., 2734 Tennyson Rd., Cleveland, O.
Jonah & George, Merrimac, Mass.
Metal Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.
Never-Rub—See Springfield Auto Top & Upholstery Co.
North & Judd Mfg. Co., New Britain, Conn. "Anchor." (See page 521.)
O'Brien Mfg. Co., Joseph F., 391 Broadway, New York, N. Y.
Pennsylvania Rubber Co., Jeannette, Pa.
Smith & Co., Jos. N., E. Grand Blvd. & Dubois St., Detroit, Mich.
Springfield Auto Top & Upholstery Co., 226 Chestnut St., Springfield, Mass. "Never-Rub."
Ufasco—See Unique Findings & Supply Co.
Unique Findings & Supply Co., Providence, R. I. "Ufasco."
Western Brass Mfg. Works, Marshall Blvd., 21st St. & C. B. & Q. R. R., Chicago, Ill.
Woodruff & Sons Co., Walter W., Mount Carmel, Conn.

SEPARATORS, GASOLINE—See Strainers, Gasoline

SEPARATORS, Oil

De Laval Separator Co., New York, N. Y. (See page 601.)

SEPARATORS, Storage Battery

(Wood and Composition Separators; for Rubber Separators—See Rubber, Hard)

Ferry-Mark Mfg. Co., 2119 Bismarck St., St. Louis, Mo.

SERVICE STATIONS—See Stations, Electric Service

SET SCREWS—See Screws, Cap

SETS, Rivet

Braunsdorf-Mueller Co., Elizabeth, N. J.
Carver Tool Works, Spring Valley, N. Y.
Drew & Co., C., Kingston, N. Y.
Kraeuter & Co., Newark, N. J.
Lowentraut Mfg. Co., P., 36-54 Brenner St., Newark, N. J.
Peck, Stow & Wilcox Co., Southington, Conn. "Pexto."
Pexto—See Peck, Stow & Wilcox Co.
Red Devil—See Smith & Hemenway.
Rich Tool Co., Railway Exchange, Chicago, Ill.
Smith & Hemenway, 130 Colt St., Irvington, N. J. "Red Devil."
Vaughan & Bushnell Mfg. Co., 2114-38 Carroll Ave., Chicago, Ill.

SETS, Wiring, for Fords

(Complete ignition wiring cut to lengths and fitted with necessary terminals)

Becco—See Michigan Motor Specialties Co.
Dim Auto Lite Switch Co., Monroe, Mich.
E G Mfg. Co., 250 W. 54th St., New York, N. Y. (Dealers.) (See page 215.)
Evergood—See Grossman Mfg. Corp.
Faw, J. H., 37 Warren St., New York, N. Y. "Fawsco." (See page 387.)
Fawsco—See Faw, J. H.
Ferro, M. C., 2011 Michigan Ave., Chicago, Ill. (See page 489.)
Goodrich-Lenhart Mfg. Co., 429 Widener Bldg., Philadelphia, Pa. (See page 111.)
Grossman Mfg. Corp., Emil, Bush Terminal Bldg. No. 20, Brooklyn, N. Y. "Evergood."
Hyway—See Staff & Eckhouse.
Michigan Motor Specialties Co., 26-40 Dubois St., Detroit, Mich. "Becco."
Midway Mechanical Co., 1555 Selby Ave., St. Paul, Minn.
Motor Parts Co., 843 N. Broad St., Philadelphia, Pa. (See page 459.)
Rosco—See Rosen & Co.
Rosen & Co., A. W., 610-14 Broadway, New York, N. Y. "Rosco."
Staff & Eckhouse, 1432 S. Michigan Ave., Chicago, Ill. "Hyway." (See page 529.)
White, J. M., 1116-22 Olive St., Philadelphia, Pa.

SHACKLE BOLTS — See Bolts, Spring Shackle

SHACKLE LUBRICATORS—See Lubricators, Spring and Shackle Bolt

SHADES, HEADLIGHT—See Dimmers, Headlight

SHAFT COUPLINGS—See Couplings

SHAFT LOGS, MOTOR BOAT—See Logs, Motor Boat Shaft

SHAFT STEADY BEARINGS—See Bearings, Drive Shaft Steady

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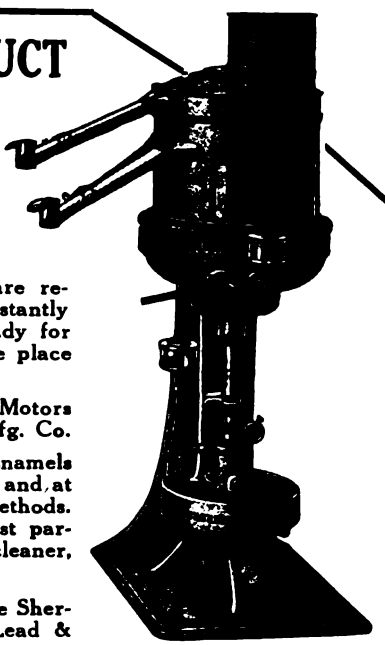

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Oils: Cutting, Motor Block Test, Lubricating, are reclaimed and cleansed. All grit and dirt are instantly removed and the oil delivered immediately ready for re-use. De Laval Special Centrifugals take the place of slow, wasteful, cumbersome filtering devices.

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Japans, Color Varnish, Lacquers, Shellacs and Enamels are reclaimed and clarified much more quickly and at much lower cost than is possible by filtration methods. De Laval Special Centrifugals remove the finest particles of dirt and sediment and produce a cleaner, smoother finish.

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"SECURITY" BALL JOINTS

Not too tight nor too loose—Always in proper adjustment—No Cotter Pins to lose—No Screws to come out—Easily put in place—Impossible to come apart—Ball Head in line with rod—Firm Joint—No Rattle—

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SHAFTING, Flexible

(For driving Speedometers, Odometers or Taximeters)

Breeze Mfg. Co., 250-52 South St., Newark, N. J.

Coates Clipper Mfg. Co., 237 Chandler St., Worcester, Mass.

Gem Mfg. Co., Goebel & Fulton Sts., Pittsburgh, Pa.

Motors Appliance Co., East Moline, Ill. (See page 781.)

Stow Flexible Shaft Co., 26th & Callowhill Sts., Philadelphia, Pa.

Stow Mfg. Co., 443 State St., Binghamton, N. Y.

Webb Mfg. Co., ft. Center St., Newark, N. J. (See page 715.)

White Dental Mfg. Co., S. S., 5-9 Union Sq., W., New York, N. Y.

SHAFTS, CAM—See Camshafts, Finished

SHAFTS, COUNTER—See Countershafts, Finished

SHAFTS, CRANK—See Crankshafts, Finished

SHAFTS, FLEXIBLE—See Shafting, Flexible

SHAFTS, Propeller

(Complete Propeller Shaft assemblies to blue print or specification; for Universal Joints only—See Joints, Universal)

Arvac Mfg. Co., Anderson, Ind. (See page 789.)

Hartford Auto Parts Co., Hartford, Conn. (See page opposite inside back cover.)

K-B—See Kinsler-Bennett Co.

Kinsler-Bennett Co., 69 Vernon St., Hartford, Conn. "K. B." (See page 375.)

Salisbury Wheel & Axle Co., Jamestown, N. Y. (See page opp. Last Page.)

Schirmer Co., 7319 W. Madison St., Cleveland, O. "Schwitzer."

Schwitzer—See Schirmer Co.

Spicer Mfg. Corp., South Plainfield, N. J. (See page 501.)

Universal Machine Co., Adams St., Bowling Green, O.

SHAFTS, Rear Axle

Auto Engineering Co., 429-31 Bagg St., Detroit, Mich. (See page 83.)

Foreman, W. D., 1607 Prairie Ave., Chicago, Ill.

SHAFTS, Rear Axle, for Fords

Angiers, 500 N. Vermilion St., Streator, Ill.

Bridgers Co., J. D., Irby & Front Sts., Florence, S. C.

Gibbes Machinery Co., Columbus, S. C.

H & M—See Radius Rod Co.

Radius Rod Co., Lamoni, Ia. "H & M."

Salisbury Wheel & Axle Co., Jamestown, N. Y. (See page opp. Last Page.)

Spencer Metal Products Co., Spencer, O.

Vetter, W. G., 316 Flyn St., Alva, Okla.

SHAFTS, Tractor Propeller

Hartford Auto Parts Co., Hartford, Conn. (See page opposite inside back cover.)

Hoosier Auto Parts Co., 718 S. Elliott St., Muncie, Ind.

K-B—See Kinsler-Bennett Co.

Kinsler-Bennett Co., 69 Vernon St., Hartford, Conn. "K. B." (See page 375.)

SHAPERS, AIRCRAFT PROPELLER BLADE—See Machines, Aircraft Propeller Blade Shaping

SHAPERS, Metal

American Tool Works Co., Sixth & Eggleston Sts., Cincinnati, O.

Boynton & Plummer, Chester Depot, Vt.

Cincinnati Shaper Co., Elam St. & Garrard Ave., Cincinnati, O.

Cochrane-Bly Co., St. James Park, Rochester, N. Y.

Columbus—See Osborne & Sexton Machinery Co.

Davis Machine Tool Co., 305 St. Paul St., Rochester, N. Y.

Duff, William E., York, Pa. (Dealer.) (See page 457.)

Gould & Eberhardt, Chancelor & Colt Sts., Irvington, N. J.

Hendey Machine Co., Torrington, Conn.

Juengst & Sons, Geo., Croton Falls, N. Y.

Kelly Co., R. A., W. Main St., Xenia, O.

Niles-Bement-Pond Co., 111 Broadway, New York, N. Y.

Ohio Machine Tool Co., Kenton, O.

Osborne & Sexton Machinery Co., Fourth & Russell Sts., Columbus, O. "Columbus."

Potter & Johnston Machine Co., 1035 Newport Ave., Pawtucket, R. I.

Queen City Machine Tool Co., 1405 Sycamore St., Cincinnati, O.

Rhodes Mfg. Co., 948 Park St., Hartford, Conn.

Rockford Machine Tool Co., Kiswaukee & 23d Sts., Rockford, Ill.

Smith & Mills Co., Spring Grove Ave. & Township St., Cincinnati, O.

Springfield Machine Tool Co., Southern Ave. & P. C. & St. L. R. R., Springfield, O.

Stapf & Co., John B., Dunkirk, N. Y.

Steptoe Co., John, 2961 Colerain Ave., Cincinnati, O.

Stockbridge Machine Co., Worcester, Mass.

SHAPERS, Wood

Advance Machinery Co., Van Wert, O.

American Wood Working Machinery Co., 591 Lyell Ave., Rochester, N. Y.

Barker & Co., Wm., Pleasant & Wheeler Sts., Covington, Ky.

Bentel & Margedant Co., Hamilton, O.

Cordesman, Meyer & Co., 53-57 Central Ave., Cincinnati, O.

Cordesman-Rechtin Co., Cincinnati, O.

Crescent Machine Co., Leetonia, O.

Defiance Machine Works, 434 Perry St., Defiance, O.

Fay & Egan Co., J. A., 415 W. Front St., Cincinnati, O.

Hall & Brown Woodworking Machine Co., Broadway & Ninth St., St. Louis, Mo.

Jones Superior Machine Co., 1258-72 W. North Ave., Chicago, Ill.

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All work milled from Solid Bar with cut threads.

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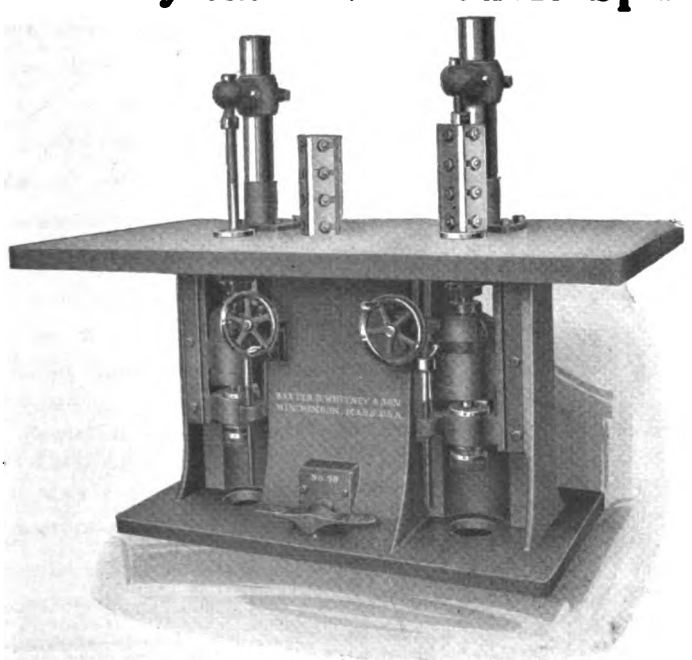

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No Countershaft required. No belts to buy.

Saves power and floor space.

Can be placed anywhere, regardless of shafting.

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The Shapers are made for heavy, medium and light work.

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SHAPERS, Wood (Continued)

Porter Machinery Co., C. O., 666-68 Front Ave., N. W., Grand Rapids, Mich.

Power & Co., L., 20 S. 23d St., Philadelphia, Pa.

Pryibil Machine Co., P., 512-24 W. 41st St., New York, N. Y.

Smith Machine Co., H. B., Smithville, N. J.

Whitney & Son, Baxter D., Winchendon, Mass. (See pages 329 and 603.)

SHEARS, Rotary

Yoder Co., Engineers Bldg., Cleveland, O.

SHEAVES and Pulleys

(For Horn and Cut-out Cables)

Western Brass Mfg. Works, Marshall Blvd., 21st St. & C. B. & Q. R. R., Chicago, Ill.

SHEET ALUMINUM—See Aluminum

SHEET ASBESTOS—See Asbestos

SHEET BRASS—See Brass, Sheet

SHEET COPPER—See Brass and Copper, Sheet

SHEET FELT—See Felt, Sheet

SHEET FIBRE—See Fibre, Hard

SHEET METAL TESTING INSTRUMENTS —See Instruments, Metal Testing

SHEET PACKING—See Packing

SHEET RUBBER—See Rubber, Hard

SHEET STEEL—See Steel

SHELLS, BOILER—See Shells, Copper; also Shells, Steel

SHELLS, Copper Boiler

Randolph-Clowes Co., Waterbury, Conn.

SHELLS, Steel Boiler

Janney-Steinmetz & Co., Philadelphia, Pa. (See page 683.)

Pressed Steel Tank Co., Greenfield Ave., West Allis, Wis.

SHELVING, METAL—See Racks, Metal Tool

SHIELD STRIPS—See Strips, Wind Shield Weather

SHIELDS, Aeroplane

Goodyear Tire & Rubber Co., 1144 E. Market St., Akron, O.

SHIELDS, PLUG, FOR FORDS — See Shields, Spark Plug

SHIELDS, RADIATOR — See Covers or Shields, Radiator

SHIELDS, RAIN—See Visors, Wind Shield

SHIELDS, SHOE—See Protectors, Shoe

SHIELDS, Spark Plug, for Fords

J. & B. Mfg. Co., Pittsfield, Mass.

SHIELDS, Tonneau

(Special adjustable shields for the protection of rear seat passengers in open cars)

Beatonson—See Sharrer Patent Top Co.

Clark & Son, A. N., Plainville, Conn.

Columbia Tire & Top Co., 922 Commonwealth Ave., Boston, Mass.

Perkins Improved Windshield Co., 453 W. 53d St., New York, N. Y. (See page 605.)

Sharrer Patent Top Co., 239 W. 56th St., New York, N. Y. (Importers.) "Beatonson." (See page 751.)

Tonneau Shield Co., 1777 Broadway, New York, N. Y. (See page 605.)

SHIELDS, TOP—See Visors, Top

SHIELDS, Wind

Ackerman—See Smith & Co.

Ainsworth Mfg. Co., 36 Dubois St., Detroit, Mich.

Alexander Mfg. Co., J., 1931 Broadway, New York, N. Y. (See page 457.)

Auto Wind Shield Co., University Rd., Cambridge, Mass.

Badger Mfg. Corp., Milwaukee, Wis. (See page 139.)

Banker Wind Shield Co., Ellsworth & Negley Aves., Pittsburgh, Pa.

Columbia Tire & Top Co., 922 Commonwealth Ave., Boston, Mass.

Cox Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y.

De Tamble Mfg. Co., 1607-11 Prairie Ave., Chicago, Ill.

Douglas & Lomason Co., 642 Lincoln Ave., Detroit, Mich.

Empire Gear & Top Co., 207 N. 22d St., Philadelphia, Pa.

English & Mersick Co., New Haven, Conn. (See page 573.)

Ford-Clark Co., 3125 Perkins Ave., Cleveland, O.

Gemco Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. (See page 135.)

Hartford Windshield Mfg. Co., 1006 S. Los Angeles St., Los Angeles, Cal.

Kimball & Co., C. P., Chicago, Ill. (See page 137.)

Monarch Auto Accessory Mfg. Co., 78 Main St., Buffalo, N. Y.

Moore Co., W. J., Montague Ave. & Joy St., Caro, Mich.

Motor Products Corporation, Detroit, Mich. (See page 231.)

Murray & Co., P. A., Newton, Mass.

Poison Mfg. Co., 1754 Main St., Buffalo, N. Y.

Smith & Co., Jos. N, E. Grand Blvd. & Dubois St., Detroit, Mich. "Ackerman."

Springfield Harness Co., 55-61 Dwight St., Springfield, Mass.

Star Brass Works, 2623 McGee Ave., Kansas City, Mo.

Triplex Safety Glass Corp., 19 W. 44th St., New York, N. Y.

Troy Carriage Sun Shade Co., 710 Lincoln Ave., Troy, O.

Zenite Metal Co., 201-05 N. West St., Indianapolis, Ind. (See page 469.)

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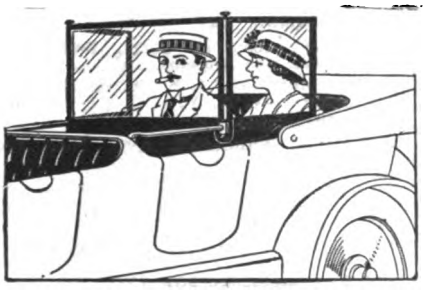

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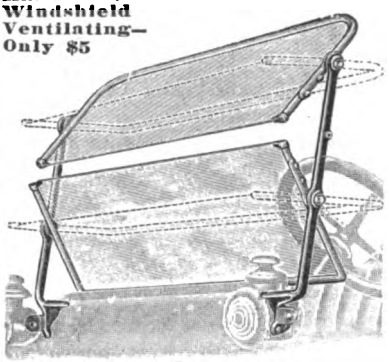

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SHIELDS, Wind, for Fords

Buob & Schen, 500-10 Webster Ave., Cincinnati, O. (See page 711.)

Ford-Clark Co., 3125 Perkins Ave., Cleveland, O.

Motor Products Corporation, Detroit, Mich. (See page 231.)

Triplex Safety Glass Cap, 19 W. 44th St., New York, N. Y.

SHIFTERS, Automatic Gear

C-H—See Cutler Hammer Mfg. Co.

Cutler Hammer Mfg. Co., 890 St. Paul Ave., Milwaukee, Wis. "C-H."

Laursen—See United States Auto Gear Shift Co.

Nuway Mfg. Co., Otis Bldg., Chicago, Ill.

United States Auto Gear Shift Co., Truax Bldg., Eau Claire, Wis. "Laursen."

SHIMS and Liners, Brass and Copper

Chandler Co., Napier St., Springfield, Mass.

Fitzgerald Mfg. Co., Torrington, Conn. (See page 309.)

Gasket Supply Co., 1728 Ludlow St., Philadelphia, Pa. "Right." (See page 439.)

Kales Stamping Co., 443-59 Lafayette Blvd., Detroit, Mich.

Kickhaefer Mfg. Co., 199-201 Oregon St., Milwaukee, Wis. (See page 785.)

Laminated Shim Co., 533 Canal St., New York, N. Y. "Laminum." (See page 609.)

Laminum—See Laminated Shim Co.

McCord Mfg. Co., Detroit, Mich. (See pages 558 and 559.)

Metropolitan Mfg. Co., Oakman Ave. & Detroit Terminal R. R., Detroit, Mich. (See page 641.)

Right—See Gasket Supply Co.

SHIMS, DEMOUNTABLE RIM—See Plates, Demountable Rim Wedge

SHIPPING BAGS—See Bags, Shipping

SHIPPING BLOCKS—See Chocks, Blocks and Clamps, Car Shipping

SHIPPING CHOCKS—See Chocks, Blocks and Clamps, Car Shipping

SHIPPING CLAMPS—See Chocks, Blocks and Clamps, Car Shipping

SHIPPING COVERS—See Covers, Paper and Canvas Shipping

SHOCK Absorbers

(See Springs, Supplementary; also Straps, Rebound)

Badger Mfg. Corp., Milwaukee, Wis. (See page 139.)

Blackledge Mfg. Co., John W., 341 E. Ohio St., Chicago, Ill. "Velvet."

Connecticut Shock Absorber Co., Meriden, Conn.

Cox Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y. "E-Zer."

E-Zer—See Cox Brass Mfg. Co.

Flentje, Ernst, 1643 Cambridge St., Cambridge, Mass.

Gabriel Mfg. Co., 1407 40th St., N. E., Cleveland, O.

Hartford, Edward V., 172 Morgan St., Jersey City, N. J. (See page 607.)

Houdaille Shock Absorber Co., 1737 Broadway, New York, N. Y.

J. H. S.—See Sager Co.

Kane Mfg. Co., Centralia, Wash.

Landis Engineering & Mfg. Co., 231 Ringgold St., Waynesboro, Pa.

Martin Shock Absorber Corp., 1301-1401 E. Slauson Ave., Los Angeles, Cal.

Metal Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

Reed Co., Brookville, Pa.

Retrac Co., 52 Vanderbilt Ave., New York, N. Y.

S & S—See Starkweather-Snook Corp.

Sager Co., J. H., 36-38 S. Water St., Rochester, N. Y. "J. H. S."

Starkweather-Snook Corp., Fort Madison, Ia. "S & S."

Velvet—See Blackledge Mfg. Co.

Westinghouse Air Spring Co, Smedley Bldg., New Haven, Conn.

SHOCK Absorbers for Fords

(See also Springs, Supplementary; also Straps, Rebound)

Bethlehem—See Silvex Co.

C. S.—See Canton Specialty Co.

Canton Specialty Co, Canton, Ill. "C. S." (See page 609.)

Connecticut Shock Absorber Co., Meriden, Conn.

Cox Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y.

Gabriel Mfg. Co., 1407 40th St., N. E., Cleveland, O.

Hartford, Edward V., 172 Morgan St., Jersey City, N. J. (See page 607.)

Lang Engineering Co., J. S., 6 Park Sq., Boston, Mass. "National."

Metal Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

National—See Lang Engineering Co.

Plunkett Shock Absorber Co., 323-27 Washington St., Brooklyn, N. Y.

S & S—See Starkweather-Snook Corp.

Silvex Co., South Bethlehem, Pa. "Bethlehem."

Starkweather-Snook Corp., Fort Madison, Ia. "S & S."

SHOCK ABSORBERS, Aeroplane

Goodyear Tire & Rubber Co., Akron, O. (See page 861.)

SHOE PROTECTORS — See Protectors, Shoe

SHOES, Brake, for Fords

(Including both lined or faced and unlined shoes)

Adamson Mfg. Co., East Palestine, O. (See page 749.)

American Machine Products Co., Marshalltown, Ia. (See page 523.)

Au-To Compressor Co., Wilmington, O. "Oro."

Buckeye—See Central Brass & Fixture Co.

Central Brass & Fixture Co., Dept. A., Springfield, O. "Buckeye." (See page 137.)

Central Foundry Co., Marshalltown, Ia.

Clament Mfg. Co., East End Trust Bldg., Pittsburgh, Pa. "Shumaker."

Crum-Wiley Mfg. Co., Peru, Ind.

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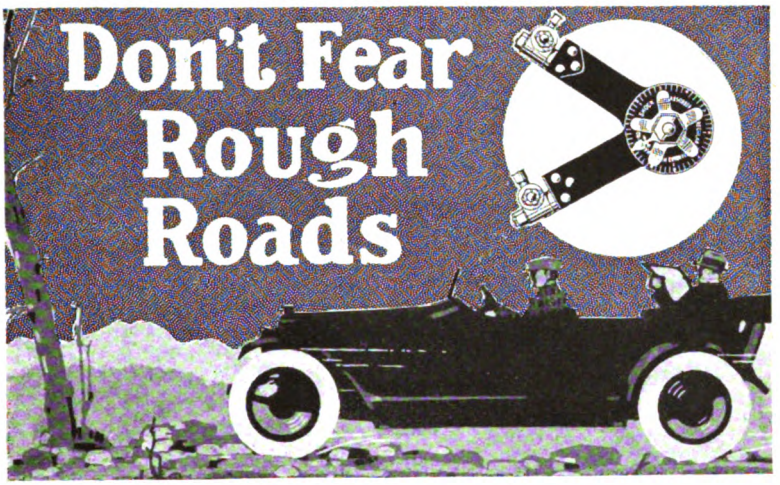

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A real absorber of shocks. It assimilates them all—from the minutest oscillation to the most pronounced jolt and jounce. Its control is *constant*. It incessantly guards the mechanism of a car. An unfailing antidote for wear and tear. The surest prescription for comfort. Prices: $60; $50; $40; $30; Ford, $22.50.

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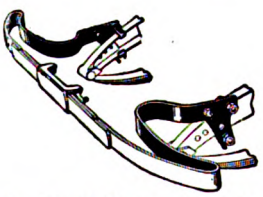
The final word in car protection is that strong, flexible, superb car guard, front and back—the



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SHOES, Brake, for Fords (Cont'd)

Evergood—See Grossman Mfg. Corp.
Ever Safe—See Never Break Products Co.
Franklin Machine Co., Main St. Station, Franklin, N. H.
Goodrich-Lenhart Mfg. Co., 429 Widener Bldg., Philadelphia, Pa. (See page 111.)
Grossman Mfg. Corp., Emil, Bush Terminal Bldg. No. 20, Brooklyn, N. Y. "Evergood."
Hill-Smith Metal Goods Co., Dept. H, Boston, Mass. (See page 221.)
Howell Co., W. H., Geneva, Ill.
Humboldt Machine & Stamping Co., 81-85 Tenth St., Long Island City, N. Y.
Illinois Brass Mfg. Co., 226-30 W. Ontario St., Chicago, Ill.
Metal Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.
Motor Parts Machine Co., 645-49 S. Pierce St., Milwaukee, Wis.
Never Break Products Co., Bangor, Pa. "Ever Safe." (See page 783.)
Oro—See Au-To Compressor Co.
Perfection—See Worthington, A. P.
Prescott Auto Parts Co., Webster, Mass. (See page 591.)
Raybestos Co., Bridgeport, Conn. (See page 341.)
Shumaker—See Clament Mfg. Co.
Spencer's Sons, I. S., Guilford, Conn.
Whitehouse-LeCompte Mfg. Co., 42-54 Elm St., Newark, N. J.
Worthington, A. P., 700 N. Main St., Los Angeles, Cal. "Perfection."

SHOES, Inner Tire

(Shoes or Sleeves to be used between outer shoe and inner tube as a protector and reinforcement. For Outer Shoes—See Sleeves, Tire Repair)

Acme—See Chicago Tire Goods Co.
Acme—See Jackson-Eno Rubber Co.
Ajar—See Chicago Tire Goods Co.
American—See Chicago Tire Goods Co.
American Automobile Accessories Co., B. & O. R. R. & Blue Rock St., Cincinnati, O.
American Rubber & Tire Co., 100 Beach St., Akron, O.
Arlington—See Voorhees Rubber Mfg. Co.
Armored Tire Co., 141-45 W. Austin Ave., Chicago, Ill.
Atlas Rubber Co., 215 N. Desplaines St., Chicago, Ill.
Atwell Mfg. Co., 825 N. Main St., Independence, Mo.
Best Rubber Co., 7804 Carnegie Ave., Cleveland, O.
Brownie—See States Mfg. Co.
Bull Dog—See Pennsylvania Rubber Co.
Bull Dog—See Polson Rubber Co.
Bull Dog Tire Repair Co., 18 S. Fifth Ave., Chicago, Ill.
Chicago Tire Goods Co., 1216 Webster Ave., Chicago, Ill. "Acme," "Ajax," "American."
Coffield Tire Protector Co., Reibold Bldg., Dayton, O.
Continental Rubber Works, 1902 Liberty St., Erie, Pa. "Vitalic."
Cox, David H., Chestnut St., Roselle, N. J.
Double Fabric Tire Co., 60 W. Ninth St., Auburn, Ind. "Interlock."
Dural Rubber Corp., Maple Ave., Flemington, N. J.
Egyptian—See Polson Rubber Co.
Essex Rubber Co., Trenton, N. J.
Excel Rubber Co., Wadsworth, O. "X. L."
Falls Rubber Co., Cuyahoga Falls, O.
Federal Rubber Co. (Cudahy), Milwaukee, Wis.
Firestone Tire & Rubber Co., Miller & Sweitzer Aves., Akron, O.
Fisher Mfg. Co., 1530 N St., Lincoln, Neb
Ford & Lyon, Prichard St., Fitchburg, Mass.
General Tire & Rubber Co., E. Market St., Akron, O. "Vulc-Tite."
Goodrich Co., B. F., S. Main St., Akron, O.
Goodyear Tire & Rubber Co., Akron, O. (See page 861.)
Hagstrom Bros. Mfg. Co., Lindsborg, Kans.
India Rubber Tire Co., 1512 S. Michigan Ave., Chicago, Ill.
Indiana Rubber & Insulated Wire Co., Jonesboro, Ind.
Inner Shoe Tire Co., Front & Shawmut Sts., Grand Rapids, Mich. "Innershu," "Shur-hold," "Klincher."
Innershu—See Inner Shoe Tire Co.
Interlock—See Double Fabric Tire Co.
Jackson-Eno Rubber Co., 1010 S. Main St., Los Angeles, Cal. "Acme," "Peerless," "Samson," "Leech."
K & W Rubber Co., 20-24 Third St., Ashland, O. "Maxotire."
Keystone Rubber Mfg. Co., Erie, Pa.
Klincher—See Inner Shoe Tire Co.
Lafayette Tire Co., 511-13 N. Ninth St., Lafayette, Ind. "Red Cross."
Lee Tire & Rubber Co., 245 W. 55th St., New York, N. Y.
Leech—See Jackson-Eno Rubber Co.
M. & M. Mfg. Co., Lime & Western Aves., Akron, O. "Norka."
Marshall Tire Co, 79 Purchase St., Fall River, Mass.
Mattson Rubber Co., Lodi, N. J.
Maxotire—See K & W Rubber Co.
Miller, Chas. E., 1400 S. Meridian St., Anderson, Ind.
Miller Rubber Co., Dept. A 43, Akron, O. (See page 705.)
Norka—See M. & M. Mfg. Co.
Peerless—See Jackson-Eno Rubber Co.
Peerless—See Polson Rubber Co.
Peerless Tire Protector Co., 713-15 E. Pike St., Seattle, Wash.
Pennsylvania Rubber Co., Jeannette, Pa. "Bull Dog."
Polson Rubber Co., 1423 Kansas St., Kansas City, Mo. "Bull Dog," "Egyptian," "Peerless."
Portage Rubber Co., Barberton, O.
Quaker City Rubber Co., 629 Market St., Philadelphia, Pa.
Racine Rubber Co., Racine, Wis.
Ray Tire & Rubber Co., 833 Rees St., Chicago, Ill.
Red Cross—See Lafayette Tire Co.
Reinforced Innertube Co., Brocton, Mass.
Samson—See Jackson-Eno Rubber Co.
Savage Tire Co., Main & Sicard Sts., San Diego, Cal.
Security Blow-out Holder Mfg. Co., Leggett Bldg., Fairfield, Ia.
Shur-Hold—See Inner Shoe Tire Co.
Sierra—See Sturges Co.
Spencer—See Voorhees Rubber Mfg. Co.
Star—See States Mfg. Co.
States Mfg. Co., 1029-37 W. Adams St., Chicago, Ill. "Brownie," "Star."
Stephens Rubber Co., A. J., Kansas City, Mo. "Superior."
Sterling Tire Corp., Rutherford, N. J.
Sturges Co., V. K., 26th & Union Sts., Oakland, Cal. "Sierra."
Superior—See Stephens Rubber Co.

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"Laminated Shims in Motor Bearings Mean Efficiency

Time is saved. Accuracy and Cleanliness assured. All three mean *Money.*" Laminated Shims offer all the advantages of all other shimming methods, and in addition permit exceptionally quick work and extremely accurate adjustment

LAMINUM

The MATERIAL for SHIMS

is like a solid sheet of brass but is made up of leaves of hard brass (.002 in.) held together by a metallic binder, permitting rapid and very close adjustment by the removal of a leaf at a time. You turn up a corner and pull it off. Laminum is furnished through jobbers in sheets or stock stampings, such as shims for Ford motors, etc.

Catalog on request.

LAMINATED SHIM CO.

533 CANAL ST. 2113 DIME BANK BLDG.

NEW YORK CITY DETROIT

Mazura Mfg. Co., St. Louis

W&C

The Original DOUBLE ARM Shock Absorber

This Trade Mark Is the Sign of Over 100,000 Sets of W & C—The Original Double Arm Shock Absorber—In Actual Use on Ford Cars Today

The unqualified success that comes to one product in each field, marks the progress of the third year for W & C—the original double arm shock absorber for Ford cars.

Established from coast to coast—in the catalogs of leading jobbers, stocked by leading dealers, used by more than 100,000 Ford motorists— W & C stands first in service and success.

It is the one shock absorber that does more than you expect

$10

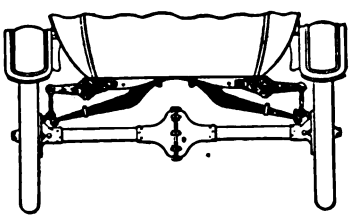
Per Set of Four

PHILIP H. WEBBER & CO.

HOOPESTON, ILLINOIS

A Million Ford Owners Are Waiting For This

SHOCK ABSORBER



To fill the demand for a shock absorber specially constructed for the Ford Car, the "C. S." Single Arm Shock Absorber was designed.

It is of the friction type with adjustable tension—fits all Ford models and sells for only $16 per set of four.

If you are looking for a real Ford necessity—something that sells with very little effort and that will bring you in a good profit on each sale—write us today for our terms to the trade.

Canton Specialty Company, Canton, Ill.

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SHOES, Inner Tire (Continued)

Thermoid Rubber Co., Trenton, N. J. (See pages 373 and 397.)

Twentieth Century Tire Protector Co., Midlothian, Tex.

United States Tire Co., Broadway & 58th St., New York, N. Y. (See page 695.)

Universal Chemical Co., 1230 Parker Ave., Indianapolis, Ind.

Viking—See Voorhees Rubber Mfg. Co.

Vitalic—See Continental Rubber Works.

Voorhees Rubber Mfg. Co., 18-46 Bostwick Ave., Jersey City, N. J. "Arlington," "Spencer," "Viking."

Vulc-Tite—See General Tire & Rubber Co.

Waban Webbing Co., 207 Essex St., Boston, Mass.

Woodworth Mfg. Corp., Niagara Falls, N. Y. (See page 721.)

X-L—See Excel Rubber Co.

SHOP BOXES—See Boxes, Sheet Metal

SHOP VULCANIZERS—See Vulcanizers, Shop

SHOVELS, COLLAPSIBLE—See Spades, Collapsible

SIDE CARS, MOTORCYCLE—See Cars, Motorcycle Side

SIDE LAMP BRACKETS—See Brackets, Side and Tail Lamp

SIDE LAMPS—See Lamps

SIGHT-FEEDS, Independent

(For installing on dash or instrument boards to show when oil is feeding or flowing properly—see also Gages)

American Brass & Iron Co., Detroit, Mich. (See page 153.)

Commonwealth Brass Corp., Commonwealth Ave. & Grand Trunk Ry., Detroit, Mich.

Crum-Wiley Mfg. Co., Peru, Ind.

Essex Brass Co., G. B., 480-86 Franklin St., Detroit, Mich.

Hancock Mfg. Co., 770 Henry St., Charlotte, Mich.

Imperial Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill. (See page 733.)

Janusch's Machine Shop, F., 509 Roscoe St., Chicago, Ill.

Krahn Mfg. Co., 588 Clinton St., Milwaukee, Wis.

Lee Co., Wm. O., Port Huron, Mich.

Lunkenheimer Co., Beekman & Waverly Sts., Cincinnati, O.

Mayo-Skinner Mfg. Co., 2115 Elston Ave., Chicago, Ill. (See page 539.)

Michigan Lubricator Co., Detroit, Mich. (See page 195.)

Morris Co., George W., Racine, Wis. (See page 861.)

Nagel Electric Co., W. G., 28-32 St. Clair St., Toledo, O.

Pedersen Lubricator Co., 626 First Ave., New York, N. Y.

Powell Co., Wm., 2525 Spring Grove Ave., Cincinnati, O. (See page 195.)

United States Gauge Co., New York, N. Y. (See page 301.)

Wilkinson Co., Wm. H., West Medway, Mass.

SIGNALS, Direction Indicating or Traffic

(Devices for attaching to a car to enable the operator to indicate when a turn or stop is about to be made)

Arrow Mfg. Co., 618-22 Broadway, Toledo, O. "Fla. Ray."

Auto Accessory Mfg. Co., 1109-13 Sixth St., Racine, Wis.

Auto Indicator Co., 209 Ottawa Ave., N. W., Grand Rapids, Mich. (See page 861.)

Auto Stop Signal Co., 455 Hippodrome Annex, Cleveland, O.

Barkoot, K. G., 1010-11 Chamber of Commerce, Detroit, Mich. (Sole Distributor for Roedding Signal Tail Lights.) (See page 613.)

Borneo Signal Co., 1621 Market St., San Francisco, Cal.

Britton Auto Signal Co., 1137 Champlain St., Toledo, O.

Brownell, F. A., Andrews St., Rochester, N. Y. "Universal."

Bunyan Signal Light Co., 2018 W. 99th St., Cleveland, O. "Tell-U-When." (See page 613.)

Comer—See Wonder Sales Co.

Cowles & Co., C., New Haven, Conn. (See page 339.)

Denver Traffic Signal & Mfg. Co., 131 15th St., Denver, Colo.

Fla-Ray—See Arrow Mfg. Co.

Gopher Specialty Co., 800 S. Tenth St., Minneapolis, Minn. "Mac's."

Hand-y Signal Co., 134 E. 110th St., New York, N. Y.

Hysig Co., 701 North Ave., Plainfield, N. J.

International Automatic Appliance Co., Mutual Life Bldg., Buffalo, N. Y.

Kloepfer-Springfield Autophore Co., 10 W. High St., Springfield, O.

Lexington Signal Co., Lexington, Ky.

Mac's—See Gopher Specialty Co.

Moore Signal & Mfg. Co., 3300 Jackson Blvd., Chicago, Ill.

Naillik Motor Signal Co., 641 Atlantic Ave., Boston, Mass.

National Auto Signal Co., 140-42 W. Seventh St., St. Paul, Minn. (See page 657.)

Neverout—See Rose Mfg. Co.

Nokolyd Signal Co., 40 W. 13th St., New York, N. Y.

Pittsburgh Lamp, Brass & Glass Co., Pittsburgh, Pa.

Quartette Automobile Signal Co., Hibernian Bldg., Los Angeles, Cal.

Roedding Signal Tail-Light—See Barkoot, K. G.

Rose Mfg. Co., 910 Arch St., Philadelphia, Pa. "Neverout."

Rothermich, A. P., 2915 N. Taylor Ave., St. Louis, Mo.

Safety Signal Corp., Galesburg, Ill. (See page 405.)

Sasco—See Standard Auto Signal Co.

Semaphore Auto-Signal Co., 794 E. 158th St., New York, N. Y.

Signalite Mfg. Co., 522 S. Clinton St., Chicago, Ill.

Singer Auto Traffic Signal Co., 3917 Olive St., St. Louis, Mo.

Smith Signal Corp., 53-55 W. 66th St., New York, N. Y.

Standard Auto Signal Co., 1401-03 Illuminating Bldg., Cleveland, O. "Sasco." (See page 863.)

Tell-U-When—See Bunyan Signal Light Co.

Universal—See Brownell, F. A.

Universal Specialty Co., 1405-07 S. Seventh St., St. Louis, Mo.

Wonder Sales Co., 616-17 Hippodrome Bldg., N. E., Cleveland, O. "Comer." (See pages 611 and 612.)

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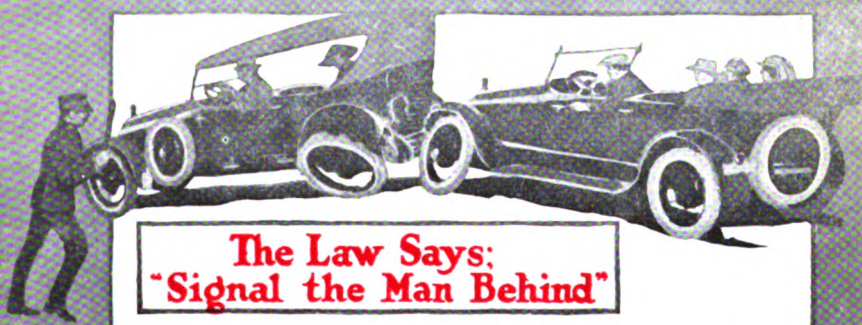
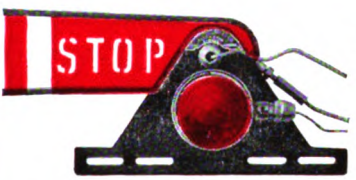
WONDER SALES PRODUCTS



The Law Says:
"Signal the Man Behind"



COMER AUTO-STOP SIGNAL

HOW IT WORKS

Connects direct to brake rod—only six screws and two bolts. Simple construction. No complicated mechanism. No switches — no push buttons — no levers to operate.

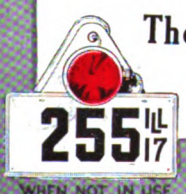
Includes tail light, consumes same amount of current as regular 2 candle power tail light. (Light in semaphore (signal arm) 2 candle power.) Lights only when semaphore is up. Two models, single and double contact.

The Comer Auto-Stop Signal is absolutely automatic. Slightest pressure on foot brake operates signal automatically—instantly.

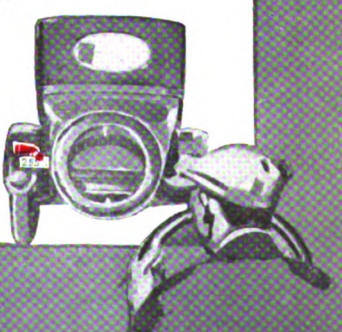
Dealers write for sales propositions.

Retail price $15.00 complete.
West of Denver $17.50.

F. O. B. Factory



The Wonder Sales Co.
616-617 Hippodrome Bldg.,
Cleveland, Ohio



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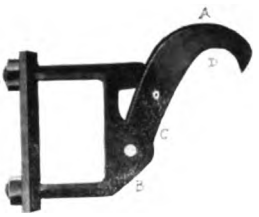
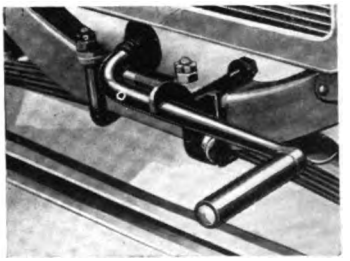
WONDER SALES PRODUCTS

KETCH-A-KICK

This simple device is saving many a Ford owner from a broken arm. One should be on every car. They operate as follows:

A—Where crank strikes and presses hook down. Crank passing over hook.
B—Coil Spring brings hook back to place.
C—Where crank strikes when engine kicks.
D—Crank strikes at C. slides up to D, disengaging crank from engine, and is caught by hook. "Safety first," and no broken arm.





BLO-Z-OUT

Blo-Z-Out is a liquid to be poured into the cylinders when the engine is HOT.

Upon striking the hot piston and cylinder walls it becomes a penetrative vapor which liquidizes as the engine gets cold and makes a wet, soft or plastic substance of the carbon. It is then necessary to drive 15 or 20 miles to dry out, by degrees, this wet or plastic carbon. As it dries it forms a very fine powder which blows out the exhaust unnoticed.

A user of Blo-Z-Out recently wrote us his experience:

"After traveling 12,000 miles in my new Twin-Six Packard, I had occasion to raise the head of the cylinders for the first time for the purpose of grinding the valves, which was done under my personal supervision, and I wish to make the statement that we did not find carbon enough in the entire engine to fill two thimbles. To my mind this is valuable information to Automobile Owners, as it is positive proof of the quality of 'BLO-Z-OUT' as a CARBON REMOVER."

LO-OIL ALARM

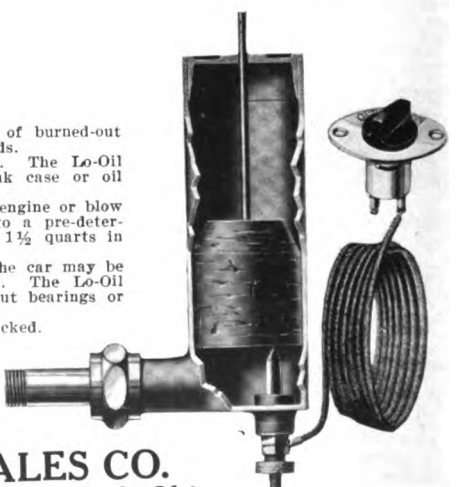
The LO-OIL ALARM has driven the fear of burned-out BEARINGS from thousands of motorists' minds.

It is simple in construction, yet efficient. The Lo-Oil Alarm is placed at the bottom of the crank case or oil reservoir.

The wiring is connected to either stop the engine or blow the horn when the oil supply has dropped to a pre-determined level, preferably when there is about 1½ quarts in reserve.

A switch is conveniently located so that the car may be driven until the supply may be replenished. The Lo-Oil Alarm is positive insurance against burned-out bearings or scored cylinders.

Complete with switch and wiring neatly packed.



$5.00

THE WONDER SALES CO.

616-617 Hippodrome Bldg., Cleveland, Ohio

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Eliminate your Battery Troubles and Expenses by using

THE EWING BATTERY SAVER

This Battery Saver will automatically break the circuit of the ignition when motor stops with the switch on, which will eliminate the burning and pitting of the platinum points of ignition, also the discharging of the battery which will shorten the life of it.

For full particulars write to Dept. B.

EWING AND EWING, Jeromeville, O.

The Gasograph

This Reliable and Accurate Dashboard Gasoline Indicator SELLS ITSELF.

The car owner will appreciate the comfort and convenience this instrument will add to his car.

He need never walk for gasoline nor have to leave his seat to ascertain the quantity of gasoline the tank contains regardless of its location while this instrument is on the dash before his eyes.

Manufacturers, this desirable and convenient equipment will attract purchasers to your cars. Write for prices and test.

Wide awake DEALERS will reap the profits by having a stock of GASOGRAPHS on hand.

For all cars with vacuum or gravity feed tank having tank in rear $7.00. Having tank under front seat $6.00. Jobbers and Dealers secure our proposition. GASOGRAPH Department.

New Standard Adding Machine Co.
3705 Forest Park Blvd., St. Louis, Mo.

THE GASOGRAPH is easily installed in a few moments without mutilation to the tank. The pressure created by the weight of gasoline is transmitted through copper tubing to the pressure instrument on the dash, the quantity being automatically indicated on the dial by position of the hand. Operates without floats or springs.

SELLS AT SIGHT

THE ROEDDING SIGNAL TAIL LIGHT

The best selling accessory on the market.

A simple demonstration makes a prospect a purchaser. You'll want one yourself.

Just a little slide of a button located on your steering wheel instantly signals your driving movements to those following—Stop—Back—Right—Left.

Selling price attractively low.

Let me send you literature and sales plans for your territory.

K. G. BARKOOT

1010-11 Chamber of Commerce
Detroit, Mich.

The "TELL-U-WHEN"

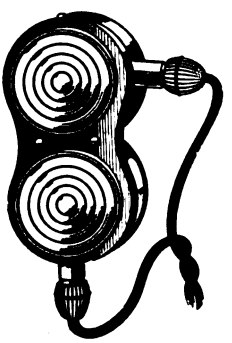
Auto Safety Signal

Every car on the road needs one of these Safety Signals. They are sold at a price that appeals to every car owner—can be attached to any car.

By operating the automatic switch you change the signal from red to green and as soon as switch is released the green goes back to red.

Nothing could be more simple or more positive in preventing rear-end collision.

Sell ready to attach, $4.50—dealers should write for discount to the trade.



THE BUNYAN SIGNAL LIGHT CO.

2018 West 99th Street CLEVELAND, OHIO

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SIGNS, RADIATOR—See Monograms, Ornamental

SIGNS, Special Road

(Mirrors or reflectors of special design that glow red when the rays from the car headlights strike them—for use as danger signs or signals)

Automatic Signal & Sign Co., 905 Rex Ave., N. E., Canton, O.

SILENCERS, EXHAUST—See Mufflers

SILENCERS, FENDER, FOR FORDS—See Bracers, Mud Guard

SILENCERS, MUD GUARD, FOR FORDS—See Bracers, Mud Guard

SILENCERS, RADIUS ROD, FOR FORDS—See Anti-Rattlers, Radius Rod

SILENCERS, SPINDLE ARM, FOR FORDS—See Anti-Rattlers, Spindle Arm

SILENCERS, STEERING COLUMN, FOR FORDS—See Braces, Steering Column

SILENCERS, STEERING ROD, FOR FORDS—See Anti-Rattlers, Steering Rod

SILK, Spool

Meyer & Co., John C., Lowell, Mass.
Sauquoit Silk Mfg. Co., Philadelphia, Pa.

SILK, Upholstery

Cheney Bros., South Manchester, Conn.
Sauquoit Silk Mfg. Co., Philadelphia, Pa.

SILLS, WOOD BODY—See Parts, Wood

SILVER, GERMAN—See Brass, Sheet

SINGLE SPARK IGNITION SYSTEMS—See Systems, Single Spark Ignition

SIREN HORNS—See Horns, Siren

SKID CHAIN FASTENERS—See Fasteners, Tire Chain

SKIDS, Car Raising

(For facilitating repair work or cleaning—used as a substitute for a pit)

Montour Steel Co., Montour Falls, N. Y.
Portable Auto Trench Co., 2 Depot Yard, Lynn, Mass.

SLAT IRONS—See Irons, Slat

SLEEVE PROTECTORS—See Protectors, Sleeve

SLEEVES or Bands, Tire Repair

(For lacing or strapping around a tire to close a puncture or blowout. For Sleeves to be used between inner tube and outer shoe—See Shoes, Inner Tire)

Acme—See Chicago Tire Goods Co.
American Chain Co., Bridgeport, Conn. "Dobbins." (See page 309.)
Atco—See Autocrat Tire Co.
Atlas Rubber Co., 215 N. Desplaines St., Chicago, Ill.
Auto Tire Boat Co., 1210 Webster Ave., Chicago, Ill.
Autocrat Tire Co., Main & F Sts., Midlothian, Tex. "Atco."
Badger Handle Co., Kuppmeier Bldg., Milwaukee, Wis.
Brictson Mfg. Co., W. O. W. Bldg., Omaha, Neb.
Bull Dog—See Polson Rubber Co.
Chicago Rawhide Mfg. Co., 1301 Elston Ave., Chicago, Ill. "Krome."
Chicago Tire Goods Co., 1216 Webster Ave., Chicago, Ill. "Acme."
Colorado Tire & Leather Co., Denver, Colo. "Durable."
Continental Rubber Works, 1902 Liberty St., Erie, Pa. "Vitalic."
Cook & Bro., E. C., 1301-45 Carroll Ave., Chicago, Ill.
Corona—See Voorhees Rubber Mfg. Co.
Cox, David H., Chestnut St., Roselle, N. J.
Dobbins—See American Chain Co.
Double Fabric Tire Co., 60 W. Ninth St., Auburn, Ind.
Durable—See Colorado Tire & Leather Co.
Empire Tire & Rubber Co., Mulberry St. & Clinton Ave., Trenton, N. J.
Essex Rubber Co., Trenton, N. J.
Falls Rubber Co., Cuyahoga Falls, O.
Federal Rubber Co. (Cudahy), Milwaukee, Wis.
Firestone Tire & Rubber Co., Miller & Sweitzer Aves., Akron, O.
Fisher Mfg. Co., 1530 N St., Lincoln, Neb.
Ford & Lyon, Prichard St., Fitchburg, Mass.
G. & K.—See Graton & Knight Mfg. Co.
General Tire & Rubber Co., E. Market St., Akron, O.
Goodrich Co., B. F., S. Main St., Akron, O.
Goodyear Tire & Rubber Co., Akron, O. **(See page 861.)**
Graton & Knight Mfg. Co., Worcester, Mass. "G. & K." **(See page 99.)**
Hager & Son, Chas., 1926 Broadway, New York, N. Y.
Indiana Rubber & Insulated Wire Co., Jonesboro, Ind.
Inner Shoe Tire Co., Front & Shawmut Sts., Grand Rapids, Mich.
Jackson-Eno Rubber Co., 1010 S. Main St., Los Angeles, Cal.
K. & W. Rubber Co., 20-24 Third St., Ashland, O.
Keystone Rubber Mfg. Co., Erie, Pa.
Kimball Tire Case Co., 163 Broadway, Council Bluffs, Ia.
Krome—See Chicago Rawhide Mfg. Co.
Lafayette Tire Co., 511-13 N. Ninth St., Lafayette, Ind. "Red Cross."
Lee Tire & Rubber Co., 245 W. 55th St., New York, N. Y.
Legnard & Co., A. B., Sheridan Rd. & Madison St., Waukegan, Ill.
M. & M. Mfg. Co., Lime & Western Aves., Akron, O.
Mattson Rubber Co., Lodi, N. J.
Michelin Tire Co., Milltown, N. J.
Miller, Chas. E., 1400 S. Meridian St., Anderson, Ind.
National Leather Belting Co., 342 E. 38th St., New York, N. Y.
Peerless Tire Protector Co., 713-15 E. Pike St., Seattle, Wash.
Pennsylvania Rubber Co., Jeannette, Pa.
Polson Rubber Co., 1423 Kansas St., Kansas City, Mo. "Bull Dog."

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Rex Piston Ring Co.

MANUFACTURERS

OF

THE REX RING

A RADICAL IMPROVEMENT IN PISTON RING MANUFACTURE. The Rex Ring has not only the outside diameter spring, it also embodies an entirely new feature in side spring, which prevents the fast movement in grooves of the pistons.

Send for catalog and literature

REX PISTON RING COMPANY

Rivard and Mullet Streets

DETROIT **MICHIGAN**

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SLEEVES or BANDS, Tire Repair (Continued)

Portage Rubber Co., Barberton, O.
Racine Rubber Co., Racine, Wis.
Red Cross—See Lafayette Tire Co.
Rugg & Co., E. L., Newark, O.
Sturges Co., V. K., 26th & Union Sts., Oakland, Cal.
Twentieth Century Tire Protector Co., Midlothian, Tex.
United States Tire Co., Broadway & 58th St., New York, N. Y. (See page 695.)
Universal Tire Protector Co., Angola, Ind.
Vitalic—See Continental Rubber Works.
Voorhees Rubber Mfg. Co., 18-46 Bostwick Ave., Jersey City, N. J. "Corona."
Wearwell Rubber Co., Kokomo, Ind.
Woodworth Mfg. Corp., Niagara Falls, N. Y. (See page 721.)

SNAP HOOKS—See Hooks, Snap

SNAP LOOPS—See Loops, Brass Snap

SOAPS, Automobile

(See also Polishes, Automobile)

Amalie—See Sonnenborn Sons.
Amberzo—See Columbia Refining Co.
American Crown—See Kirk & Co.
American Oil Corp., Jackson, Mich. "Amoco."
American Soap & Washoline Co., 140-80 Central Ave., Cohoes, N. Y. "Liberty."
Amoco—See American Oil Corp.
Arco Co., Euclid Ave. & E. 65th St., Cleveland, O.
Armour Soap Works, 81st Pl. & Benson St., Chicago, Ill. "Lustro."
Arnold, N. B., 1 Sigourney St., Brooklyn, N. Y. "Silkup."
Arnstein, Eugene, 45 W. 26th St., Chicago, Ill. "Century."
Auto-King—See Lautz Bros. & Co.
Balkan—See Jones & Bro.
Banner Chemical Co., 2301 15th St., Denver, Colo.
Batola—See Monahan Antiseptic Co.
Baum's Castorine Co., 104 N. George St., Rome, N. Y.
Be-Be-Co.—See Boston Blacking Co.
Blue Ribbon—See International Metal Polish Co.
Boston Blacking Co. (E. Cambridge), Cambridge, Mass. "Be-Be-Co."
Buck & Co., E. A., Worcester, Mass. "Powero."
Buckeye—See Davis-Young Soap Co.
Camden Chemical Mfg. Co., 18th & Mickle Sts., Camden, N. J. "Greyhound."
Century—See Arnstein, Eugene.
Chariot—See Fiske Bros. Refining Co.
Chemical Supply Co., E. 93d St. S. E. & Erie R. R., Cleveland, O.
Cincinnati Oil Works Co., 525 Eggleston Ave., Cincinnati, O.
Cleaneasy—See Winn, Wm. R.
Clenzo—See Puritan Oil & Paint Co.
Climax Lubricating Co., 218 N. 13th St., Philadelphia, Pa.
Colgate & Co., 199 Fulton St., New York, N. Y. "Moto Bright."
Columbia Refining Co., 90 West St., New York, N. Y. "Amberzo."
Davies-Young Soap Co., Findlay St. & Big Four R. R., Dayton, O. "Buckeye."
Detroit White Lead Works, 530-60 Milwaukee Ave., E., Detroit, Mich.
Duplex—See Enterprise Oil Co.
Durkee-Atwood Co., Minneapolis, Minn. "Rie-Nie."
E-Fec-Tiv—See Permatite Mfg. Co.
Eagle Oil & Supply Co., 45 India St., Boston, Mass. "Eoco."
Eastern Supply Co., Hammond & Canterbury Sts., Worcester, Mass.
Eavenson & Sons, J., Delaware & Penn Sts., Camden, N. J. "Jesco."
Energine Refining & Mfg. Co., The Arcade, Cleveland, O.
Enterprise Oil Co., 164 Chandler St., Buffalo, N. Y. "Duplex."
Eoco—See Eagle Oil & Supply Co.
Fairchild & Bro., M. H., 6 W. Austin Ave., Chicago, Ill.
Faultless—See Hawkeye Oil Co.
Fisk Mfg. Co., ft. Walker St., Springfield, Mass.
Fiske Bros. Refining Co., 24 State St., New York, N. Y. "Chariot."
Ford & Dennen—See Richmond & Co.
Frazer Lubricator Co., 3921 Normal Ave., Chicago, Ill.
Globe Soap Co., Cincinnati, O.
Good, James, 939-41 N. Front St., Philadelphia, Pa.
Great Western Oil Co., 2855 E. 37th St., Cleveland, O.
Green Lion—See Puritan Soap Co.
Greyhound—See Camden Chemical Mfg. Co.
Hall-Thompson Co., Hartford, Conn. "Wonder Worker." (See page 739.)
Harral Soap Co., 132-36 Havemeyer St., Brooklyn, N. Y. "Kleeneasy."
Harris Oil Co., A. W., 326 S. Water St., Providence, R. I.
Hawkeye Oil Co., Miles & Roosevelt Sts., Waterloo, Ia. "Faultless."
Haws, Geo. A., 135 Front St., New York, N. Y. "Panhard."
Hollingshead Co., R. M., 112 N. Ninth St., Camden, N. J. "Whizoil."
Houghton & Co., E. F., 240 W. Somerset St., Philadelphia, Pa.
International Metal Polish Co., Quill St. & Belt R. R., Indianapolis, Ind. "Blue Ribbon."
Jesco—See Eavenson & Sons.
Jewel—See Wadsworth-Howland Co.
Jones & Bro., J., 429 Locust St., Philadelphia, Pa. "Balkan."
Kenney Mfg. Co., F., 360-68 Dorchester Ave., Boston, Mass.
Kirk & Co., James S., 106 E. Austin Ave., Chicago, Ill. "American Crown."
Kleeneasy—See Harral Soap Co.
Kleno Mfg. Co., North Weymouth, Mass.
Layton Park Oil & Soap Co., M. & M. Bank Bldg., Milwaukee, Wis.
Lautz Bros. & Co., Hanover, Lake & Lloyd Sts., Buffalo, N. Y. "Auto-King."
Liberty—See American Soap & Washoline Co.
Lin-O—See Strunz & Son.
Loos & Dilworth, 134 S. Front St., Philadelphia, Pa.
Lustro—See Armour Soap Works.
McLean-Jones Oil & Supply Co., 40 India Wharf, Boston, Mass.
Magic—See Zurn Co.
Marathon—See Weinberg & Co.
Martin-Senour Co., 2510 Quarry St., Chicago, Ill.
Master—See Pure Oil Co.
Miller's Sons, Wm. P., Brooklyn, N. Y. "Pan-O-Lite."

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SOAPS, Automobile (Continued)

Millers Sons Co., A. D., Columbus & Preble Aves., Pittsburgh, Pa. "Perfection."

Mobo—See Stanley, John T.

Monahan Antiseptic Co., 166-72 N. Curtis St., Chicago, Ill. "Simplex," "Batola."

Monarch Mfg. Co., Council Bluffs, Ia.

Monogram—See New York Lubricating Oil Co.

Moore Oil Co., York St. & McLean Ave., Cincinnati, O.

Moto Bright—See Colgate & Co.

Murphys—See Phoenix Oil Co.

National Oil Products Co., 15 Bergen St., Harrison, N. J.

National Oil & Supply Co., 180 Frelinghuysen Ave., Newark, N. J. "Viscos."

National Refining Co., Rose Bldg., Cleveland, O.

New York Lubricating Oil Co., 116 Broad St., New York, N. Y. "Monogram."

O'Neil Oil & Paint Co., 297-303 E. Water St., Milwaukee, Wis. "Velvet."

Pan-O-Lite—See Miller's Sons.

Panhard—See Haws, Geo. A.

Parker Refining Co., 1307 W. 11th St., Cleveland, O.

Parker-Rishor Sales Co., 50 S. Water St., Rochester, N. Y. "Parko."

Parko—See Parker-Rishor Sales Co.

Perfection—See Millers Sons Co.

Perfection—See Warren Refining & Chemical Co.

Permatite Mfg. Co., 67 Fifth Ave., N. E., Minneapolis, Minn. "E-Fec-Tiv."

Phoenix Oil Co., 2554 W. Fifth St., Cleveland, O. "Murphys."

Pioneer Mfg. Co., Harvard Ave. & E. 103d St., Cleveland, O. "Shino."

Powero—See Buck & Co.

Pure Oil Co., First St. & 13th Ave., S., Minneapolis, Minn. "Puritan," "Master."

Puritan—See Pure Oil Co.

Puritan Oil & Paint Co., 1218 W. 70th St., Cleveland, O. "Clenzo."

Puritan Soap Co., 500 Exchange St., Rochester, N. Y.

Rexine Co., Pennsylvania & River Sts., Sheboygan, Wis.

Richmond & Co., C. C., 40 Batterymarch St., Boston, Mass. "Ford & Dennen."

Rie-Nie—See Durkee-Atwood Co.

Robertson Products Co., O. B. 700-04 W. Division St., Chicago, Ill. "20th Century," "T. B. R."

Sanozone Chemical Co., 5 N. 20th St., Philadelphia, Pa.

Shino—See Pioneer Mfg. Co.

Simplex—See Monahan Antiseptic Co.

Silkup—See Arnold, N. B.

Sonneborn Sons, L., 262 Pearl St., New York, N. Y. "Amalie." (See page 277.)

Speare's Sons Co., Alden, 140 Sixth St., Boston, Mass.

Standard Oil Co. of N. Y., 26 Broadway, New York, N. Y.

Stanley, John T., 630 W. 30th St., New York, N. Y. "Mobo."

Strunz & Son, S., 708 Bingham St., Pittsburgh, Pa. "Lin-O."

Sullivan Oil Co., 413 Wells St., Chicago, Ill.

Superior—See Durkee-Atwood Co.

Superior Oil Co., Century Bldg., Cleveland, O.

T. B. R.—See Robertson Products Co.

Tropical Paint & Oil Co., W. 70th St. & L. S. & M. S. Ry., Cleveland, O.

20th Century—See Robertson Products Co.

20th Century Soap Co., 6 Beacon St., Boston, Mass. ("Whyto." (See page 617.)

Van Tilburg Oil Co., 2424-28 University Ave., S. E., Minneapolis, Minn. "Wang."

Velvet—See O'Neil Oil & Paint Co.

Viscos—See National Oil & Supply Co

Wadhams Oil Co., 357 Clinton St., Milwaukee, Wis. "Woco."

Wadsworth-Howland Co., 225 N. Carpenter St., Chicago, Ill. "Jewel."

Wang—See Van Tilburg Oil Co.

Warren Refining & Chemical Co., Cleveland, O. "Perfection."

Washzum—See White & Bagley Co.

Weinberg & Co., J. H., 128 Maiden Lane, New York, N. Y. "Marathon."

White & Bagley Co., Worcester, Mass. "Washzum." (See page 479.)

Whizoil—See Hollingshead Co.

Whyto—See 20th Century Soap Co.

Winn, Wm. R., 143 Maiden Lane, New York, N. Y. "Cleaneasy."

Woco—See Wadhams Oil Co.

Wonder Worker—See Hall-Thompson Co.

Zurn Co., O. F., 2736-38 N. Broad St., Philadelphia, Pa. "Magic."

SOAPS and PASTES, Hand

American Soap & Washoline Co., 140-80 Central Ave., Cohoes, N. Y. "S. & H."

Armour Soap Works, 31st Pl. & Benson St., Chicago, Ill.

Arnold, N. B., 1 Sigourney St., Brooklyn, N. Y. "Silkup."

Atwell Mfg. Co., 825 N. Main St., Independence, Mo.

Auto Remedy Co., Evans St., Cincinnati, O. "Magic."

Be-Be-Co.—See Boston Blacking Co.

Blue Ribbon—See International Metal Polish Co.

Blue Ribbon Mfg. Co., 27 Baldwin St. (Charlestown), Boston, Mass. "Peerless," "Premium."

Boston Blacking Co. (E. Cambridge), Cambridge, Mass. "Be-Be-Co."

Champion—See Gardner & Co.

Clean-Paw—See Frost, F. E.

Cleaneasy—See Winn, Wm. R.

Cleanup—See Flash Chemical Co.

Cleanzum—See White & Bagley Co.

Colgate & Co., 199 Fulton St., New York, N. Y.

Corliss Supply Co., 1906 Olive St., St. Louis, Mo.

Durkee-Atwood Co., Minneapolis, Minn. "Rie-Nie."

E-Fec-Tiv.—See Permatite Mfg. Co.

E-Ze Products Co., 3 E. 14th St., New York, N. Y.

Eastern Supply Co., Hammond & Canterbury Sts., Worcester, Mass. "Use Me."

Eavenson & Sons, J., Delaware & Penn Sts., Camden, N. J. "Jesco."

Ericka Mfg. Co., 382 Liberty St., Springfield, Mass. "Itsafine."

Faultless—See Hawkeye Oil Co.

Fiebing Chemical Co., 238-40 Reed St., Milwaukee, Wis. "Presto."

Finga-Brite—See Rath Mfg. Co.

Flash Chemical Co., 160-70 Second St., Cambridge, Mass. "Cleanup."

Frazer Lubricator Co., 3921 Normal Ave., Chicago, Ill.

Frost, F. E., 505 Main St., Worcester, Mass. "Kuick Klean," "Clean-Paw," "Zip."

Gardner & Co., 222 E. 34th St., New York, N. Y. "Champion."

Git Mfg. Co., 92 Franklin St., Westfield, Mass.

Gre-Solvent—See Utility Co.

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SOAPS and PASTES, Hand (Continued)

Grim-Off—See Pitts Sanitary Co.
Grime-Off—See Pacific Coast Borax Co.
Hall-Thompson Co., Hartford, Conn. "Wonder Worker." (See page 739.)
Hand-I-Wash—See Tay-Miller Mfg. Co.
Handy—See Weinberg & Co.
Hawkeye Oil Co., Miles & Roosevelt Sts., Waterloo, Ia. "Faultless."
Hollingshead Co., R. M., 112 N. Ninth St., Camden, N. J. "Krystal Soiloff."
I. C. U.—See Livingston Co.
mp—See Rath Mfg. Co.
nternational Metal Polish Co., Quill St. & Belt R. R., Indianapolis, Ind. "Blue Ribbon."
Itsafine—See Ericka Mfg. Co.
Jesco—See Eavenson & Sons.
Jewel—See Wadsworth-Howland Co.
Kleno Mfg. Co., North Weymouth, Mass.
Krystal Soiloff—See Hollingshead Co.
Kuick-Klean—See Frost, F. E.
Lava—See Waltke & Co.
Livingston Co., 161 Day St., New Haven, Conn. "I. C. U."
Magic—See Auto Remedy Co.
Miller's Sons, Wm. P., Brooklyn, N. Y. "P-O-L."
Mione Mfg. Co., Collingsdale, Pa.
Mobo—See Stanley, John T.
Monahan Antiseptic Co., 166-72 N. Curtis St., Chicago, Ill.
Monogram—See New York Lubricating Oil Co.
New York Lubricating Oil Co., 116 Broad St., New York, N. Y. "Monogram."
Northwestern Chemical Co., 610 State St., Marietta, O. "Norwesco." (See page 205.)
Norwesco—See Northwestern Chemical Co.
Oso—See 20th Century Soap Co.
Pacific Coast Borax Co., 199 William St., New York, N. Y. "Grime-Off."
Parker-Rishor Sales Co., 50 S. Water St., Rochester, N. Y. "Parko."
Parko—See Parker-Rishor Sales Co.
Peerless—See Blue Ribbon Mfg. Co.
Permatite Mfg. Co., 67 Fifth Ave., N. E., Minneapolis, Minn. "E-Fec-Tiv."
Pex Products Co., Buffalo, N. Y.
Pitts Sanitary Co., Newport, R. I. "Grim-off."
P-O-L—See Miller's Sons.
Premium—See Blue Ribbon Mfg. Co.
Presto—See Feibing Chemical Co.
Radium Compound Co., Phoenix, N. Y.
Rath Mfg. Co., Hedley & Richmond Sts., (Frankford), Philadelphia, Pa. "Finga-Brite," "Imp."
Rexine Co., Pennsylvania & River Sts., Sheboygan, Wis.
Rie-Nie—See Durkee-Atwood Co.
Robertson Vanco Co., 103 Park Ave., New York, N. Y. "Vanco."
S. & H.—See American Soap & Washoline Co.
Shofo—See Stanley, John T.
Skidoo—See Yeasell-Goldstein Corp.
Slikup—See Arnold, N. B.
Spee-Dee—See States Chemical Co.
Stanley, John T., 630 W. 30th St., New York, N. Y. "Shofo," "Mobo."
States Chemical Co., 656 W. Austin Ave., Chicago, Ill. "Spee-Dee."
Tatlock Bros., 183 Tremont St., Rochester, N. Y. "Tat's."
Tat's—See Tatlock Bros.
Tay-Miller Mfg. Co., 20th & Market Sts., Philadelphia, Pa. "Hand-I-Wash."
20th Century Soap Co., 6 Beacon St., Boston, Mass. "Oso." (See page 617.)
Uko—See Utility Co.
Universal Chemical Co., 1230 Parker Ave., Indianapolis, Ind. "Uzum."
Uno Mfg. Co., Royal Ins. Bldg., Chicago, Ill.
Use Me—See Eastern Supply Co.
Utility Co., 636 W. 44th St., New York, N. Y. "Gre-Solvent," "Uko."
Uzum—See Universal Chemical Co.
Vanco—See Robertson Vanco Co.
Wadsworth-Howland Co., 225 N. Carpenter St., Chicago, Ill. "Jewel."
Waltke & Co., Wm. E., Grand Ave. & Second St., St. Louis, Mo. "Lava."
Weinberg & Co., J. H., 128 Maiden Lane, New York, N. Y. "Handy."
White & Bagley Co., Worcester, Mass. "Cleansum." (See page 479.)
Winn, Wm. R., 148 Maiden Lane, New York, N. Y. "Cleaneasy."
Wonder Worker—See Hall-Thompson Co.
Yeasell-Goldstein Corp., 489 Buttles Ave., Columbus, O. "Skidoo."
Zip—See Frost, F. E.

SOAPSTONE, TIRE—See Talc, Tire

SOCKET PLATES, AEROPLANE WING—See Plates, Aeroplane Wing Socket

SOCKET WRENCHES — See Wrenches, Special

SOCKETS, ANTI-RATTLING BALL, FOR FORDS—See Anti-Rattlers, Radius Rod; also Anti-Rattlers, Steering Rod

SOCKETS, Bow

(For Slat Irons—See Irons, Slat)

Ajax—See Brewer Tichener Corp.
American Forging & Socket Co., Pontiac, Mich.
Ashtabula Bow Socket Co., Ashtabula, O.
Brewer-Tichner Corp., 115 Port Watson St., Cortland, N. Y. "Pioneer," "Ajax," "Buch," "Cortland."
Buch—See Brewer-Tichener Corp.
Cortland—See Brewer-Tichener Corp.
Defco—See Scherer & Co.
Desoco—See Detroit Socket Co.
Detroit Forging Co., 120 Mt. Elliott St., Detroit, Mich. "Mascot."
Detroit Socket Co., 814 Jefferson Ave., W., Detroit, Mich. "Desoco."
Mascot—See Detroit Forging Co.
Pioneer—See Brewer-Tichener Corp.
Scherer & Co., H., 280 Jefferson Ave., E., Detroit, Mich. "Defco."
Sharrer Patent Top Co., 239 W. 56th St., New York, N. Y. (See page 751.)

SOCKETS, Electric Lamp

Aid Mfg. Co., 2625-31 Stewart Ave., Chicago, Ill. "Amco."
Amco—See Aid Mfg. Co.
Anchor—See Metal Specialties Mfg. Co.
Brock Rubber Co.—See Zinke Co.
Chicago Electric Mfg. Co., 2817 S. Halsted St., Chicago, Ill. "Handy."
Connecticut Telephone & Electric Co., Meriden, Conn. (See pages 676 and 677.)

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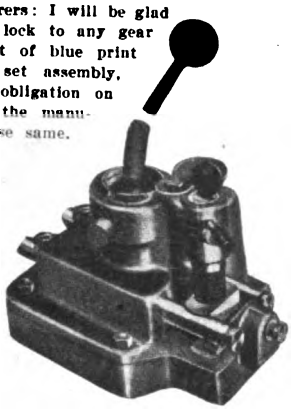

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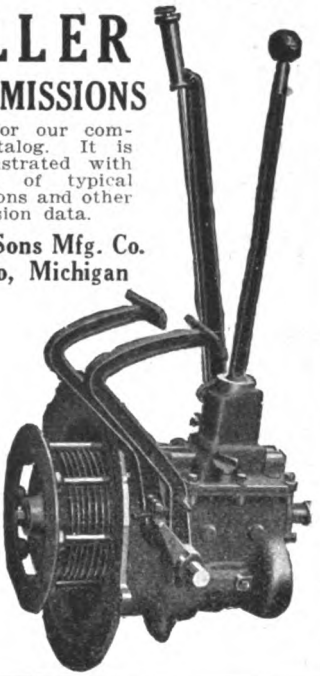

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SOCKETS, Electric Lamp (Cont'd)

Douglas & Rudd Mfg. Co., Bronson, Mich.
General Electric Co., Schenectady, N. Y. (See pages 564 and 565.)
Handy—See Chicago Electric Mfg. Co.
Higginson-Gibson Mfg. Co., 74 Atlantic St., Boston, Mass.
Howe Mfg. Co., Chicago, Ill.
Metal Specialties Mfg. Co., 338-52 N. Kedzie Ave., Chicago, Ill. "Anchor." (See page 333.)
Morse, Frank W., 289 Congress St., Boston, Mass. (See page 453.)
Picard & Co., A. J., 9 West 61st St., New York, N. Y. (Metropolitan Distributors for "Handy" Sockets.) (See page 273.)
Zinke Co., 1323-25 Michigan Ave., Chicago, Ill. (Sole Distributors for A. S. Brock Rubber Co., Boston, Mass.)

SOCKETS, STAKE—See Pockets, Truck Stake

SOCKETS, TOP—See Sockets, Bow

SOFT RUBBER TUBING—See Tubing, Soft Rubber

SOLDER, Aluminum

Acme—See Universal Fluxine Co.
Aluminum Brazing Solder Co., Broad & Edgemont Ave., Chester, Pa. "Peters."
Alumunite Mfg. Co., 427 Fourth Ave., New York, N. Y.
Alumalux Co., Sidney, O.
Arrow—See Lester Co.
Austin & Co., M. B., 700 W. Jackson Blvd., Chicago, Ill. "Mincer's."
City Brass Foundry Co., 5310 St. Clair Ave., N. E., Cleveland, O.
Delaware Brass & Aluminum Co., 20th & Walnut Sts., Muncie, Ind.
Dicks, E. M., 241 W. Center St., Marion, O.
Electric Smelting & Aluminum Co., 555 W. Jackson St., Lockport, N. Y.
Evans—See Southern Metal Co.
Howard Metal Co., Second & Canal Sts., Reading, Pa.
Ideal Bronze Co., Cleveland, O. (See page 451.)
Illinois Smelting & Refining Co., 408 N. Peoria St., Chicago, Ill. (See page 525.)
Langsenkamp, F. H., 1206-28 Shelby St., Indianapolis, Ind.
Lester Co., Fayetteville, N. Y. "Arrow."
Lumen Bearing Co., 197 Lathrop St., Buffalo, N. Y.
Metals Mfg. & Alloys Co., 1514 Prospect Ave., Cleveland, O.
Michigan Smelting & Refining Co., Detroit, Mich.
Mincer's—See Austin & Co.
More-Jones Brass & Metal Co., 3132-34 N. Broadway, St. Louis, Mo.
National Bronze & Aluminum Foundry Co., 2539 E. 79th St., Cleveland, O.
Naulty, James, 2634 N. 11th St., Philadelphia, Pa.
Peters—See Aluminum Brazing Solder Co.
Peters Engineering Co., 3202-04 Chestnut St., Philadelphia, Pa.
Reeps Mfg. Co., 50 Church St., New York, N. Y.
Reis Mfg. Co., 344 Cumberland St., Brooklyn, N. Y.
Richards & Co., 200-06 Causeway St., Boston, Mass.
Semper Idem—See Wildes Son.
So-Luminum Mfg. & Engineering Co., 1790 Broadway, New York, N. Y. (See page 623.)
Solderall Co., 129 Sussex Ave., Newark, N. J.
Southern Metal Co., Atlanta, Ga. "Evans."
Sterling Aluminum Solder Co., 200 Broadway, New York, N. Y. (See page 623.)
Thwing, C. B., 445 N. Fifth St., Philadelphia, Pa.
United Smelting & Aluminum Co., New Haven, Conn. "W. F."
Universal Fluxine Co., 183-89 Commerce St., Urbana, O. "Acme."
W. F.—See United Smelting & Aluminum Co.
Weldum Co., 25 W. 42d St., New York, N. Y.
Wildes Son, Thomas, 14 Dover St., New York, N. Y. "Semper Idem."

SOLDER, Bar and Wire

Birkenstein & Sons, S., 297 W. Ontario St., Chicago, Ill. (See page 395.)
Blatchford Co., E. W., 230 N. Clinton Ave., Chicago, Ill.
Chicago Solder Co., Chicago, Ill. "Kester." (See page 625.)
Columbia Smelting & Refining Works, Brooklyn, N. Y.
Dutch Boy—See National Lead Co.
Empire Metal Co., 320 E. Water St., Syracuse, N. Y.
Gardiner Metal Co., 1356-64 W. Lake St., Chicago, Ill.
Henning & Sons, V., 314-36 Belmont Ave., Brooklyn, N. Y.
Noyt Metal Co., 300 N. Broadway, St. Louis, Mo. (See page 161.)
Kester—See Chicago Solder Co.
Kahn Bros., 775-97 Humboldt St., Brooklyn, N. Y.
Lehman Bros., Fourth & Jefferson Sts., Hoboken, N. J. (See page 527.)
Lissberger & Son, Marks, 281 Borden Ave., Long Island City, N. Y.
Lumen Bearing Co., 197 Lathrop St., Buffalo, N. Y.
Merchant & Evans Co., Philadelphia, Pa. (See page 377.)
Metals Mfg. & Alloys Co., 1514 Prospect Ave., Cleveland, O.
More-Jones Brass & Metal Co., 3132-44 N. Broadway, St. Louis, Mo.
National Lead Co., 111 Broadway, New York, N. Y. "Dutch Boy." (See page 519.)
North American Smelting Co., 900 W. Thompson, St., Philadelphia, Pa.
Richards & Co., 200-06 Causeway St., Boston, Mass.
Taylor Co., N. & G., 308 Chestnut St., Philadelphia, Pa.
Wildes Son, Thomas, 14 Dover St., New York, N. Y.

SOLDER, SELF FLUXING—See Solder, Bar and Wire

SOLDER, WIRE—See Solder, Bar and Wire

SOLDERING ACID—See Flux, Soldering

SOLDERING FLUID—See Flux, Soldering

SOLDERING FLUX—See Flux, Soldering

SOLDERING FURNACES—See Furnaces, Soldering

SOLDERING PASTE—See Flux, Soldering

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Aluminum Can Now Be Soldered

The Secret Solved

Fig. 1

The two illustrations tell more than a volume of words—what you see in the picture is an accomplished fact.

(1) The crank case herewith shown was broken and had 13 pieces missing. Had it not been for Sterling Aluminum Solder a new crank case would have been required and the old one thrown into the "scrap heap." (2) Showing same mended with S. A. S.

Only a short time ago it was said that Aluminum "can't be soldered"—and neither it could—broken aluminum parts had to stay broken. New parts were necessary and a lot of money was lost.

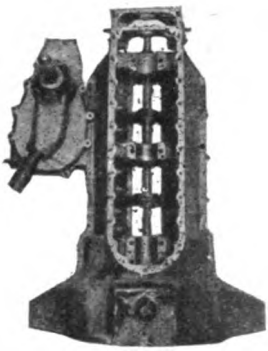

Fig. 2

Sterling Aluminum Solder has solved the problem—any crack, break or fracture can be easily and permanently repaired—and the part made stronger than new.

Sterling Aluminum Solder makes a stronger job than electric or acetylene welding because of the lower temperature, only 350 degrees against over 1,200 for welding.

The largest motor car companies are using Sterling Aluminum Solder. What it is doing for them it will do for you.

Write us today for the full story.

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STERLING ALUMINUM SOLDER

General Offices:
200 Broadway
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THE WONDERS OF

SO-LUMINUM

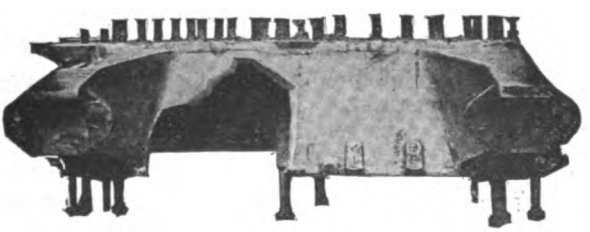
THE NEW ALUMINUM WELDING SOLDER

for Repairing Broken Aluminum Parts

Perfect substitute for acetylene welding—one quarter cost and time. Used and endorsed by U. S. Army and Navy and leading aeroplane and motor companies. The next time you have a broken piece of aluminum get SO-LUMINUM and repair it good and strong as ever.

The U. S. Navy repaired the broken 90 H.P. Fiat crank case depicted below in six hours' time and at $15.00 expense by using SO-LUMINUM, saving $400.00 and five months' time to secure a new one. This case is in perfect condition after two and a half years' constant use. Make big money by repairing broken aluminum parts in your town with SO-LUMINUM. Be first to start this profitable business. No flux or special tools required—use gasoline or any blow torch.

We mail free upon request booklet with directions—"How to Repair Broken Aluminum Parts." Send for copy today.



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Telephone 5633 Circle

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SOLDERLESS COUPLINGS—See Unions, Tubing

SOLDERLESS FITTINGS — See Unions, Tubing

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Wood Shovel & Tool Co., Piqua, O.

Wyoming Shovel Works, Wyoming, Pa.

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SPARE TIRE HOLDERS—See Holders, Tire

SPARE WHEEL CARRIERS FOR FORDS —See Holders or Carriers, Spare Wheel

SPARE WHEEL HOLDERS FOR FORDS—See Holders or Carriers, Spare Wheel

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SPARK COILS—See Coils, Spark

SPARK GAPS—See Gaps, Spark

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SPARK LEVER GRIPS—See Grips, Throttle

SPARK LEVER LOCKS FOR FORDS—See Locks, Spark Lever

SPARK PLUG BRUSHES—See Brushes, Spark Plug

SPARK PLUG BUSHINGS—See Bushings, Spark Plug Testing

SPARK PLUG CASES—See Cases, Spark Plug

SPARK PLUG CLEANERS—See Cleaners, Spark Plug

SPARK PLUG MICA—See Mica

SPARK PLUG PORCELAINS—See Porcelain

SPARK PLUG SHIELDS FOR FORDS—See Shields, Spark Plug

SPARK PLUG SWITCHES—See Switches, Spark Plug

SPARK PLUG TERMINALS—See Terminals, Wire

SPARK PLUG WRENCHES—See Wrenches, Nut and Bolt

SPARK PLUGS—See Plugs, Spark

SPARK POINTS—See Points, Sparking

SPARK RETARDERS FOR FORDS—See Retarders, Automatic Spark

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Made from Oil-Tempered Spring Wire

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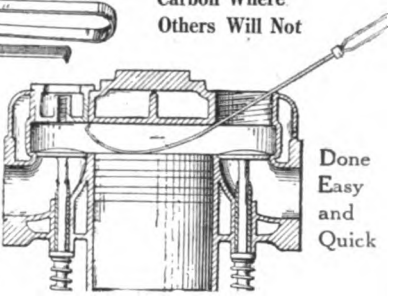
They Remove Carbon Where Others Will Not



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produces a perfect rust proof finish. It can be polished and buffed to a finish very similar to nickel plate. It holds its finish as well as nickel plate and has the advantage of being absolutely rust proof. It is without equal on work subject to severe atmospheric conditions, such as hub caps, door handles, bolts, nuts, etc.

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SPEED METERS—See Speedometers

SPEED PEDAL LATCHES FOR FORDS—See Latches, Low Speed Pedal

SPEEDOMETER DIALS—See Dials, Luminous

SPEEDOMETER GEARS—See Gears and Pinions, Speedometer

SPEEDOMETER JIGS—See Jigs, Speedometer Gear Centering

SPEEDOMETER JOINTS — See Joints, Speedometer Swivel

SPEEDOMETER LAMPS—See Lamps, Electric Dash

SPEEDOMETER LAMPS FOR FORDS—See Lamps, Electric Speedometer

SPEEDOMETER PINIONS—See Gears and Pinions, Speedometer

SPEEDOMETER REPAIR PARTS — See Parts, Speedometer Repair

SPEEDOMETERS

Corbin Brown—See Corbin Screw Corp.

Corbin Screw Corp., High St., New Britain, Conn. "Corbin Brown."

Detroit Instrument Co., 251 E. Jefferson Ave., Detroit, Mich.

Hamilton Corp., Lancaster, Pa.

Hoffecker Co., Motor Mart Bldg., Boston, Mass.

Johns-Manville Co., H. W., Madison Ave. & 41st St., New York, N. Y. (Sole Distributors for Jones Speedometer Co., Brooklyn, N. Y.)

Jones Speedometer Co.—See Johns-Manville Co.

Standard Thermometer Co., 65 Shirley St., Boston, Mass. (See page 541.)

Stewart-Warner Speedometer Corp., Chicago, Ill. (See page 499.)

Stover-Lang Co., 219-23 Columbus Ave., Boston, Mass.

Troy Carriage Sun Shade Co., Troy, O.

Van Sicklen Co., Elgin, Ill. (See page 627.)

Veeder Mfg. Co., 22 Sargeant St., Hartford, Conn.

Waltham Watch Co., Waltham, Mass.

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Corbin Screw Corp., High St., New Britain, Conn.

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Jones Speedometer Co.—See Johns-Manville Co.

Sears-Cross Co., Bush Terminal, Brooklyn, N. Y.

Standard Thermometer Co., 65 Shirley St., Boston, Mass. (See page 541.)

Stewart-Warner Speedometer Corp., Chicago, Ill. (See page 499.)

Van Sicklen Co., Elgin, Ill. (See page 627.)

SPHERICAL BALLOONS—See Balloons, Spherical

SPINDLE ARM SILENCERS FOR FORDS—See Anti-Rattlers, Spindle Arm

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Ekern Bros. Mfg. Co., Flandreau, S. Dak.

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SPLASH PANS FOR FORDS—See Pans, Radiator Splash

SPOKE TIGHTENING COMPOUNDS—See Compounds, Wood Wheel Tightening

SPOKES, Wire

National Screw & Tack Co., Cleveland, O. (See page 477.)

Standard Co., Torrington, Conn.

Wire Goods Co., 28 Union St., Worcester, Mass.

SPONGES and CHAMOIS

Bloch & Sons, A., 101 Barclay St., New York, N. Y.

Carbondale Sponge Co., 89 Fulton St., New York, N. Y. (Importers.)

Chamoline—See Van Schaack & Sons.

Davis & Sons, D., 45 Warren St., New York, N. Y. (Importers.) "Vel Volla."

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Fuchs Co., Max, 244 Pearl St., New York, N. Y.

Greek-American Sponge Co., Franklin & Randolph Sts., Chicago, Ill. (Importers.)

Hart, Albert, 366 Fifth Ave., New York, N. Y.

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Louden & Hill, 624 Arch St., Philadelphia, Pa.

Miami Drug Co., Miami, Fla.

Mermaid—See Moses Sons & Co.

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Nassau Sponge Co., 232 W. Lake St., Chicago, Ill.

National Sponge & Chamois Co., 158 William St., New York, N. Y. (Importers.)

Niehaus Co., Jos. 341 Fourth St., Cincinnati, O. (Importers.)

Rhodes & Co., James H., 157 W. Austin Ave., Chicago, Ill. (Importers.)

Smith, Kline & French Co., 429 Arch St., Philadelphia, Pa.

Sponge Divers Association, Tarpon Springs, Fla.

Van Schaak & Sons, Peter, 114-18 W. Lake St., Chicago, Ill. "Chamoline."

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SPOTLIGHTS, WIND SHIELD—See Lights, Spot

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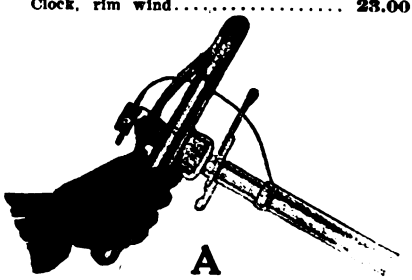

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COMBINATION
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FOR FORD CARS

More than ten thousand Van Sicklen Dimmer and Intensifiers are in the hands of Ford owners, giving universal satisfaction. This simple little device allows perfect control of Ford Headlights at any speed of the car. The switch is within finger reach of the driving hand, provides a normal, a dim or an intensified driving light instantly.

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Write for liberal Dealer's proposition.

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SPRING LEAF LUBRICATING STRIPS—See Strips, Spring Leaf Lubricating

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SPRING OILING BOXES—See Cups and Covers, Spring Leaf Lubricating

SPRING REPAIR CLAMPS—See Clamps, Spring Repair

SPRING SHACKLE BOLTS—See Bolts, Spring

SPRING SPREADERS—See Tools, Spring Leaf Separating

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Hill-Smith Metal Goods Co., Dept. H, Boston, Mass. (See page 221.)

Nelson Mfg. Co., A., 2700 Southport Ave., Chicago, Ill.

SPRINGS, Leaf

Alloy Steel Spring Co., Jackson, Mich.

American Spiral Spring & Mfg. Co., 56th & Butler Sts., Pittsburgh, Pa.

B. E. F. Auto Spring Co., 2148 Scranton Rd., Cleveland, O.

Betts Spring Co., 888 Folsom St., San Francisco, Cal.

Buckeye Spring Works, 1919 Race St., Cincinnati, O.

Buffalo Automobile Spring Co., 146 Virginia St., Buffalo, N. Y.

Cambria Spring Co., 918-21 S. Santee St., Los Angeles, Cal.

Champion Auto Spring Co., 3120 Locust St., St. Louis, Mo. (See page 645.)

Cooper Spring Co., Leader News Bldg., Cleveland, O.

Delany & Son, D., Liberty & Hamilton Sts., Newark, N. J.

Detroit Steel Products Co., Detroit, Mich. (See page 653.)

E. C.—See Hoover Spring Co.

E. C. V.—See Hoover Spring Co.

Garden City Spring Works, 2300 Archer Ave., Chicago, Ill.

Harvey Spring Co., 854 17th St., Racine, Wis. (See page 637.)

Higgins Spring & Axle Co., Dept. 1015 Racine, Wis. (See page 639.)

Hoover Spring Co., 617-37 Turk St., San Francisco, Cal. "E. C.," "E. C. V."

Iron City Spring Co., Pittsburgh, Pa. (See page 655.)

Jenkins Vulcan Spring Co., Richmond, Ind. "Vulcan." (See pages 629 to 632.)

Kalamazoo Spring & Axle Co., Portage St., Kalamazoo, Mich.

Keystone Spring Works, 18th & Buttonwood Sts., Philadelphia, Pa.

Laher Auto Spring Co., 26th St., Portland, Ore.

Liggett Spring & Axle Co., Monongahela, Pa.

Maremont Mfg. Co., 916-18 S. Wabash Ave., Chicago, Ill.

Mather Spring Co., Toledo, O. (See page 633.)

Merrill Spring Co., E. R., 526-32 W. 28th St., New York, N. Y.

National Spring Co., New Castle, Ind. "Stanley." (See page 413.)

Palmer, Jos., 333 Rutherford Ave., Boston, Mass.

Pasco—See Pittsburgh Auto Spring Co.

Penn Spring Works, Baldwinsville, N. Y.

Perfection—See Standard Parts Co.

Pittsburgh Auto Spring Co., 5915 Centre Ave., Pittsburgh, Pa. "Pasco."

Rowland, William & Harvey, Philadelphia, Pa. (See page 639.)

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Catalog of

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90,000 springs in stock

"In Every Town for Every Car"

HOW TO ORDER

If uncertain of the model you are ordering for, compare width and length as shown in the second and third columns. Our length is taken from center to center of eyes without load. To get correct length remove springs from car or jack up car until springs are in a natural position.

If you don't find what you want here, write for a complete catalogue.

You will save time by ordering from our nearest factory branch—as each branch carries a complete stock of springs.

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DALLAS, TEX.....209 S. Houston Street
SUMTER, S. C.....29 Caldwell Street
ATLANTA, GA.....48 Auburn Avenue

Model	Width, Inches	Length Eye Centers	Location	Price	Stock No.	Code
ALLEN						
37-1916	1¾	33¾	Ft.	$9.75	1325	Abdicate
37-1916	2	53½	R	21.50	1326	Ability
APPERSON						
6-48, 8-58	1¾	33	F	8.75	1350	Abundant
6-48, 8-48	2	47	LR	16.75	1351	Acclimate
BRISCOE						
1914-15	1¾	29½	F	6.00	1250	Albion
1914-15	1¾	43½	R	9.75	1251	Alpha
1916	1¾	31¾	F	6.50	1252	Alpaca
1916	1¾	41¾	R	16.75	1253	Alcade
4-24, 1917-18	1¾	30	F	10.50	1254	Alfalfa
4-24, 1917-18	1¾	32½	R	15.00	1255	Allegcry
BUICK						
10-26-27-32-33-34-35-36	1½	35	F	8.00	1100	Absent
10-26-27-32-33-34-35-36	1¾	37⅝	LR	8.00	1101	Absolve
10-26-27-32-33-34-35	1¾	38	UR	8.00	1102	Abstain
16-17	2	38	F	11.50	1103	Abstruse
19-21	2	36	F	9.50	1105	Abuse
28-29-30-31	2	34⅞	F	10.25	1108	Acclaim
28-30	2	39½	LR	12.00	1109	Accord
28-30	2	18½	UR	5.50	1110	Account
29-31	2	39¾	LR	11.50	1111	Accuse
29-31	2	18½	UR	6.75	1112	Ache
38-39-43	2	37⅝	F	12.00	1113	Achieve
38	2	45¼	LR	12.75	1114	Acorn
39-43	2	45½	LR	15.50	1115	Acquaint
39-43	2	21¾	UR	8.50	1116	Acquire
24-25-1913	1½	35¼	F	8.00	1117	Acquit
24-1913	1¾	40¼	LR	10.00	1118	Action
24-1913	1¾	18¾	UR	5.00	1119	Acute
25-1913	1¾	40½	LR	11.25	1120	Adage
25-1913	1¾	18¾	UR	5.00	1121	Adam
40-1913	2	35⅜	F	10.75	1122	Addle
40-1913	2	40	LR	11.75	1123	Adept
40-1913	2	19¼	UR	5.75	1124	Adhere
B-24-25-1914	2	35	F	8.75	1125	Adjourn
B-24-1914	2	40¾	LR	10.50	1126	Adjudge
B-24-1914	2	18¾	UR	5.75	1127	Adjust
B-25-1914	2	40¾	LR	10.75	1128	Admire
B-25-1914	2	18¾	UR	6.25	1129	Admit
B-36-37-38-1914	2	37¼	F	11.50	1130	Adore
B-36-38-1914	2¼	44	LR	12.75	1131	Adrift
B-36-38-1914	2¼	19½	UR	8.00	1132	Advent
B-37-1914	2¼	44	LR	14.25	1133	Affect
B-37-1914	2¼	19½	UR	7.50	1134	Affirm
B-55-1914	2¼	38¾	F	13.25	1135	Agate
B-55-1914	2½	51⅜	LR	27.75	1136	Agent
B-55-1914	2½	23	UR	13.00	1137	Agree
C-24-25-1915	2	35	F	8.75	1138	Ajax
C-24-1915	2	44¾	LR	11.50	1149	Apollo
C-25-1915	2	44¾	LR	13.25	1139	Author
C-25-1915	2	20	UR	6.50	1140	Anthem
C-37-1915	2	37¼	F	11.50	1130	Adore
C-37-1915	2¼	45	LR	14.50	1142	Alarm
C-37-1915	2¼	20½	UR	7.50	1144	Anvil
Four-1500 lb. Truck	2	35	F	10.50	1141	Abash
Four-1500 lb. Truck	2	38½	R	27.50	1143	Atlas
D-55-C-55-'15	2¼	40	F	14.75	1148	Arab
D-55-C-55-1917	3	49	R	33.50	1151	Algebra
D & E-45-Little Six, 1917-18	2	35⅝	F	11.00	1145	Auction
D & E-45-Little Six, 1916-17-18	2½	45¼	R	24.00	1146	Apex
D & E-44-46	2	35¾	F	14.00	1150	Alder
D & E-44-46	2½	45¼	R	24.00	1155	Apology
D & E-34-35	1¾	33½	F	8.00	1152	Alhambra
D-35-1917, 4 cyl.	2	46¼	R	12.75	1153	Alimony
D-34-1917, 4 cyl.	2	46¼	R	9.50	1154	Alkaloid
E-49	2	35	Ft.	14.50	1156	Albus
E-49	2½	45	R	30.50	1157	Altrus
E-34	2	51	R	12.00	1158	Alum
E-35	2	51	R	14.75	1159	Alumn
E-44-45-46-1918	2	35¾	Ft.	12.50	1160	Amble
CADILLAC						
30, up to 1911	2	35¼	F	11.50	1200	Babel
30, up to 1911	2	41½	RS	12.00	1201	Badge
30, up to 1911	2	37	RC	9.75	1202	Banish
30-1911	2	35¼	F	14.50	1203	Banner
30-1911	2	42	RS	14.50	1204	Baron
30-1911	2	38	RC	14.75	1205	Baton
30-1912	2	35	F	12.50	1206	Beach
30-1912	2	42	RS	16.00	1207	Beaver
30-1912	2	38½	RC	13.00	1208	Bedeck
1913	2	35¼	F	14.00	1209	Belate
1913	2	46¼	RS	17.75	1210	Bevel
1913	2	37½	RC	16.00	1211	Blast

JENKINS VULCAN SPRING CO., RICHMOND, INDIANA

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JENKINS VULCAN SPRINGS

Model	Width, Inches	Length Eye Centers	Location	Price	Stock No.	Code
CADILLAC— Cont'd						
1914	2	53	F	15.50	1212	Bless
1914	2	51½	RS	22.00	1213	Bonus
1914	2	38½	RC	16.75	1214	Borax
8-1915-16	2	41¼	F	14.75	1215	Border
8-1915-16	2	52	RS	22.00	1216	Borrow
8-1915-16	2	38	RC	14.00	1217	Bosom
55-1917, 7-pass	2	41¾	F	16.75	1222	Baggage
55-1917, 7-pass	2	53	RS	26.75	1223	Bailiff
55-1917, 7-pass	2	38¾	RC	14.50	1224	Balcony
57-1918	2	41¾	F	16.75	1222	Baggage
57-1918	2	53	RS	26.75	1223	Bailiff
57-1918	2	38¾	RC	14.50	1224	Balcony
CHALMERS						
30-F-1909	2	38	F	10.50	1400	Debate
30-F-1909	2	39½	LR	9.50	1401	Decade
30-K-1910, M-11	2	37½	F	11.50	1402	Defense
30-K-1910, M-11	2	43	LR	12.00	1403	Degree
30-K-1910, M-11	2	23	UR	8.00	1404	Detail
40	2¼	37	F	13.25	1405	Dilute
40	2¼	51½	LR	17.50	1406	Dimple
E-7-pass., 40 H.P., 9 plates	2¼	49⅝	LR	22.50	1419	Dusty
36 Model 10-'12	2	37½	F	11.50	1402	Defense
36 Model 10-'12	2	43	LR	14.50	1407	Dispel
36 Model 10-'12	2	23	UR	8.00	1408	Dinner
17-1913	2	37½	F	11.50	1402	Defense
17-1913	2	43	LR	15.25	1409	Dislike
	2	23	UR	8.00	1404	Detail
18-1913, 6-cyl	2¼	37	F	12.75	1410	Ditty
18-1913, 6-cyl	2¼	51⅛	LR	21.50	1411	Domain
18-1913, 6-cyl	2¼	21	UR	8.00	1412	Dream
24-29, 1914-15-16	2	37½	F	14.50	1413	Drench
24-29, 1914-15-16	2¼	49½	LR	20.50	1414	Dress
24-29, 1914-15-16	2¼	22	UR	11.25	1415	Ducat
26-1915	1¾	35	F	11.00	1416	Dupe
26-1915	2	44½	LR	18.75	1417	Dwell
26-1915	2	19	UR	8.00	1418	Dwarf
32-1915-16	1¾	37¼	F	10.25	1422	Damask
6-30-1916, Model Model 35	1¾	37¾	F	10.50	1420	Design
6-30-1916, Model 35	2	51½	LR	17.25	1421	Diamond
32A-6-40, Cantilever	2½	51¼	R	22.50	1423	Democrat
32B-6-40	2	55	R	18.75	1424	Dental
35B-6-30	1¾	37½	F	10.00	1425	Dentist
35B-6-30	2	51½	R	17.25	1421	Deputy
CHANDLER						
Six 1915-16	2	39¼	F	12.00	3050	Earth
Six 1915-16	2	46	LR	15.50	3051	Easter
Six 1915-16	2	15¾	UR	6.50	3052	Ebony
1917-18	2	39½	F	13.50	3053	Entry
1917-18 trg	2	54½	R	20.00	3054	Epulet
1917-18 rdstr	2	53½	R	16.00	3055	Equator
CHEVROLET						
H-2-H-4-1914-15-16	1¾	35¼	F	8.00	1500	Elude
Baby Grand H-2-1914	1¾	47¼	LR	10.75	1501	Embark
H-2-1914 to 17	1¾	21½	UR	5.50	1502	Ensign
H-4-1914 to 17	1¾	47¼	LR	12.50	1503	Envoy
H-4-1914 to 17	1¾	21	UR	6.50	1504	Essay
1915-Little Six	2	34¾	F	10.25	1505	Estate
490-1916, top or bottom	1¾	22½	F	5.00	1506	Esteem
490-1916-17-18	2	30½	R	12.00	1507	Evidence
490-1917-18, 10 leaves	3	22¾	F	8.50	1508	Equity
CROW-ELKHART						
Crow Jr.-1915-16-17	1¾	33¼	F	8.25	1650	Fairy
Crow Jr.-1915-16-17	1¾	42	LR	9.75	1651	Faith
Crow Jr.-1915-16-17			UR	5.75	1652	Famish
Crow 30-1916-17-18	1¾	33¼	F	8.25	1653	Fashion
Crow 30-1916-17-18	1¾	42	LR	9.75	1654	Fathom
Crow 30-1916-17-18			UR	6.00	1655	Fatigue
DETROITER						
A, B, C and D	1¾	36½	F	8.50	1600	Fagot
A and B	1¾	35½	RS	8.00	1601	Faint
A and B	1¾	36¼	RC	9.25	1602	Field
DODGE						
1915-16-17-18	1¾	34½	F	8.00	1550	Fast
1915-16-17-18	2	42	LR	12.00	1551	Fasten
1915-16-17-18	2	16¼	UR	4.75	1552	Fasting
DORT						
1916-17-18	2	37	F	10.75	1575	Favor
1916-17-18	2	48½	R	18.75	1576	Fertile
E. M. F.						
30-1909-10-11	2	36½	F	7.00	1700	Gallop
30-1909-10-11	2	36¾	LR	8.00	1701	Gentle
30-1909-10-11	2	36½	UR	9.00	1702	Glad
30-1912, Fore Door	2	37¼	F	7.75	1703	Glen
30-1912, Fore Door	2	38½	LR	7.75	1704	Glide
30-1912, Fore Door	2	38½	UR	9.00	1705	Glove
ELGIN						
1917	1¾	33¼	F	8.00	1825	Factor
1917	2¼	47	R	19.00	1826	Faculty
EMPIRE						
31-40 to 1915	1¾	34	F	8.50	5050	Grace
31-40 to 1915, 9 leaf	1¾	42	LR	9.50	5051	Grand
1916, Model 33	1¾	36½	F	9.50	5052	Granite
4-45, 1916-18	1¾	36½	F	9.50	5053	Graphic
4-45, 1916-18	1¾	49¾	LR	20.00	5054	Grasp
4-45, 1916-18	1¾	22¾	UR	8.00	5055	Grassy
6-60, 1916-17-18	1¾	36½	F	9.50	5056	Gravy
6-60, 1916-17-18	2	49½	LR	20.00	5057	Greeting
6-60, 1916-17-18	2	18½	UR	9.75	5058	Griddle
FEDERAL TRUCKS						
C, D, G, H, & M	2¼	39	F	14.00	1850	Horde
G, H	2½	42	R	27.25	1851	Hovel
FLANDERS						
20, 1910-11	1¾	36	F	6.50	1900	Ideal
20, 1910-11	1¾	35½	LR	6.25	1901	Idle
20, 1910-11	1¾	36	UR	7.25	1902	Ignore
20, 1912	1¾	34½	LR	6.25	1903	Image
20, 1912	1¾	34½	UR	6.25	1903	Image
FORD						
T, 7 Leaf Heavy	1½	31½	F	7.25	2000	Joy
T, Bus-Truck	1½	31½	F	9.75	2004	Joyful
T, 56" Tread	2	44½	R	20.50	2001	Judge
T, 56" Tread, Bus-Truck			R	26.00	2005	Judging
T, 60" Tread	2	48½	R	22.50	2002	Jungle
T, 60" Tread, Bus Truck			R	29.50	2006	Juniper

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JENKINS VULCAN SPRINGS

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GRANT						
1916-17-18	1½	33⅜	F	7.50	1950	Juvenile
1916-17-18	2	37¼	R	15.25	1951	Justice
HAYNES						
Light Six, 30, 1915-16	2	37½	F	12.00	3158	Jasper
Light Six, 30, 1915-16	2	50¾	R	16.75	3159	Jaunt
36-37-38, 1916-17-16	2	37½	F	12.00	3160	Jocular
36-37-38-39-40-41-1916-17	2	51½	R	18.75	3161	Javelin
35	2	51½	LR	18.00	3157	Journal
HUDSON						
20-1910-11	1¾	35½	F	7.50	2100	Label
20-1910-11	1¾	44	LR	12.75	2101	Lace
20-1910-11	1¾	21¾	UR	6.00	2102	Lady
33-1911	2	36½	F	10.50	2103	Lamb
33-1911	2	46½	LR	14.50	2104	Latch
33-1911	2	19	UR	7.50	2105	Latin
33-'12-37-'13	2	36	F	10.75	2106	Laugh
33-1912	2	48	LR	17.50	2107	Lava
33-1912	2	22	UR	7.00	2108	Lead
37-1913	2	48	LR	17.50	2109	Legion
37-1913	2	22	UR	7.00	2110	Lemon
54-1913	2	36½	F	12.75	2111	Level
54-'13, 9 leaves	2	48	LR	17.50	2112	Lilac
54-'13, 11 leaves	2	48¼	LR	21.75	2113	Linen
54-'13, 6 leaves	2	20	UR	8.00	2114	Listen
54-'13, 8 leaves	2	20	UR	10.50	2115	Livery
6-40-1914	2	38	F	12.00	2116	Lizard
6-40-1914	2	52	LR	18.75	2117	Loof
6-40-1914	2	19½	UR	6.75	2118	Locust
6-54-1914-15	2¼	37¾	F	14.75	2119	Lodge
6-54-1914-15	2½	50½	LR	23.75	2120	Loop
6-54-1914-15	2½	17	UR	7.75	2121	Lotus
6-40-1915	2	38¼	F	12.75	2122	Loving
6-40-1915	2	52¼	LR	18.75	2123	Loyal
6-40-1915	2	19	UR	6.75	2124	Lubber
6-40-1915	2	38¼	F	12.75	2122	Lucifer
6-40-1915	2	51¾	LR	14.00	2125	Lucily
6-40-1915	2	19	UR	5.75	2126	Luggage
6-40-1916	2	38⅝	F	16.00	2127	Lunar
Super Six, 1916-17-18	2	38⅝	F	16.00	2128	Luxury
Super Six, 1916-17-18	2¼	54¾	R	22.00	2129	Lynx
HUPMOBILE						
20, all models	1½	33	F	6.50	2200	Mail
20, Roadster, Std. Trd	1¾	38½	R	10.50	2201	Major
20, Touring, Std. Trd	1¾	38½	R	10.50	2202	Maple
20, Roadster, Sou. Trd	1¾	42½	R	11.50	2203	Marsh
20, Touring, Sou. Trd	1¾	42½	R	11.50	2204	Medal
20	1¾	24	A	2.00	2205	Merit
32-1912	1¾	33½	F	8.00	2206	Merry
32-1913-14	1¾	33½	F	8.00	2207	Molar
32-1912-13-14, Std. Trd	2	43	R	14.75	2208	Moral
32-1912-13-14, Sou. Trd	2	48½	R	18.50	2209	Muse
32, all models	2	26½	A	2.75	2210	Mutual
5-pass. K-1915, N-1916-17	1¾	36½	F	9.50	2211	Muzzle
5-pass. K-1915, N-1916-17	2	50	R	16.00	2212	Mystic
N, 7-pass.- 16-17	1¾	38½	F	12.00	2213	Moist
N, 7-pass.- 16-17	2	57	R	22.75	2214	Moiety
R-1918			Ft	7.75	2215	Monitor
R-1918			R	16.00	2216	Mutilate

Model	Width, Inches	Length Eye Centers	Location	Price	Stock No.	Code
INTER-STATE						
40-1913	2	38¾	F	12.75	2250	Milky
40-1913						
40-1913	2	47¼	LR	16.50	2251	Mineral
45-1914	2	21	UR	8.25	2252	Miser
45-1914	2¼	39	F	15.50	2253	Miracle
45-1914	2¼	45¾	LR	18.25	2254	Mixture
T-1915-16-17-18	2¼	21	UR	10.75	2255	Modern
T-1915-16-17-18	1¾	35¼	F	9.50	2256	Modify
T-1915-16-17-18	2	42¾	LR	12.00	2257	Mohair
	2	15	UR	4.75	2258	Monarch
MAXWELL						
25-1914-15-16, Six Leaf	1¾	39	R	8.75	2336	Nude
25-1914-15-16-17-18, 6 leaf	1¾	31½	F	7.25	2335	Nutty
25-1915-16	1¾	15¾	UR	4.00	2337	Nymph
25-1917	1¾	44¼	LR	10.75	2339	Nocturnal
25-1917	1¾	17	UR	4.75	2340	Nominate
25-1918	2	47½	R	13.00	2341	Nitro
35-1914	2	36	F	10.00	2329	Nugget
35-1914	2	39½	LR	13.50	2330	Nuisance
35-1914	2	14½	UR	4.00	2331	Nullify
MITCHELL						
Big Six, 1916-17-18	2	39¾	F	14.75	4100	Vortex
Big Six, 1916-17-18	2¼	47	R	30.25	4101	Vignette
Light Six, 16-17-18	2	39½	F	13.00	4102	Vigilant
Light Six, 16-17-18	2½	45	R	26.00	4103	Vibrate
MONROE						
Roadster 16, 1915-16-17-18	1½	35¼	F	5.75	3353	Wax
Roadster 16, 1915-16-17-18	1½	43⅝	LR	8.00	3354	Warm
Roadster 16, 1915-16-17-18	1½	20¼	UR	4.50	3355	Winter
M. 6	1¾	33⅞	Ft.	7.25	3356	Wagon
OAKLAND						
30-1910-11	1½	35	F	8.00	2400	Oakum
30-1910-11	1¾	37⅝	LR	8.00	2401	Obelisk
30-1910-11	1¾	38	UR	8.00	2402	Oblige
40-1910-11	2	35½	F	10.00	2403	Oblong
40-1910-11	2	38	R	22.25	2404	Obtuse
40-1909	2	39	LR	10.00	2424	Outdo
30-1912-13	1¾	34¾	F	9.50	2405	Obvious
35-1913	1¾	35	F	8.75	2406	Occupy
35-1913	1¾	46½	LR	14.50	2407	Octagon
35-1913	1¾	24½	UR	9.25	2408	Oculist
36-1914	1¾	35	F	8.75	2406	Occupy
37-'15-38-'16	1¾	34½	F	8.75	2418	Organic
37-'15-38-'16	1¾	45½	LR	13.50	2419	Organist
37-'15-38-16	1¾	17	UR	5.00	2420	Origin
49-1915	2	40	F	15.50	2421	Ostrich
49-1915	2	48½	LR	19.25	2422	Outbreak
49-1915	2	21½	UR	11.50	2423	Outcast
32-1916	1¾	37¾	LR	10.25	2425	Oxide
32-1916	1¾	15½	UR	5.00	2426	Oxygen
32-16, 32" long	1¾	31¾	F	9.00	2427	Outlaw
32-B-1916, 2 and 5-pass., 34½"	1¾	34¼	F	8.00	2428	Onward
32-B-16, Trg	1¾	38½	LR	9.50	2429	Opulence
32-B-16, Trg	1¾	15½	UR	4.50	2430	Orator
32-B-16, Rdstr	1¾	39¼	LR	9.50	2431	Orchard
32-B-16, Rdstr	1¾	15¾	UR	5.50	2432	Ordain
34-1917	1¾	34½	F	9.00	2433	Outline
34-1917	1¾	49½	R	14.00	2434	Ornament
50-1916-17	2	39¾	F	16.00	2435	Orderly
34-B-1918	1¾	34½	F	19.25	2438	Obligate
34-B-1918	1¾	49½	R	7.50	2439	Outburst

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OLDSMOBILE						
43-1916	2	35½	F	10.00	4052	Omnibus
43-1916			LR	14.25	4053	Offset
8-44-45, 1916-17-18	2	35½	F	10.00	4050	Outpost
8-44-45, 1916-17-18	2	47½	LR	14.25	4051	Optional
37-1918, 6-Cyl	2	35½	FR	8.75	4055	Obstinate
37-1918, 6-Cyl	2¼	52	L	19.25	4056	Outgrow
OVERLAND						
38-47	1¾	35	F	8.50	2501	Packet
38-47	1¾	35	LR	8.25	2502	Paddle
38-47	1¾	35	UR	8.00	2503	Pagan
45-46	1¾	35	F	7.25	2534	Plead
40-41-42-55-56	2	36½	F	11.25	2504	Pageant
40-41-42-45-56	2	42	LR	12.75	2505	Palace
40-41-42-55-56	2	19¼	UR	5.50	2506	Palfry
51	2	37	F	10.00	2507	Pander
51	2	42	LR	12.00	2508	Papal
51	2	18¾	UR	5.50	2509	Parade
52-53-54	2¼	39	F	14.50	2510	Paragon
52-53-54	2¼	42	LR	11.75	2511	Pardon
52-53-54	2¼	21	UR	6.75	2512	Parent
59-69	1¾	35½	F	8.25	2513	Parlor
59-69	1¾	40	LR	11.50	2514	Partial
59-69	1¾	20½	UR	5.50	2515	Pasture
60	2	37½	F	10.00	2516	Path
60	2	42	LR	12.75	2517	Patrol
60	2	20½	UR	5.75	2518	Pattern
61-71	2¼	37	F	10.50	2519	Pavilion
61-71	2¼	42	LR	13.75	2520	Pearl
61-71	2¼	20½	UR	7.25	2521	Pebble
79	1¾	35½	F	9.50	2522	Pelican
79	1¾	40	LR	12.00	2523	Penal
79	1¾	20	UR	6.50	2524	Pencil
80-1915	1¾	35½	F	10.00	2525	Pepper
80-1915	2	45	LR	14.75	2526	Perfume
80-1915	2	21½	UR	8.25	2527	Permit
81-'15-83-'16	1¾	35¼	F	9.25	2528	Perplex
81-1915	1¾	44	LR	11.50	2529	Phial
81-'15-83-'16	1¾	18	UR	5.00	2530	Picnic
82-'15-86-'16	2	37½	F	12.50	2531	Pilot
82-'15-86-'16	2	50	LR	18.25	2532	Pity
82-'15-86-'16	2	20	UR	8.00	2533	Play
83-1916	1¾	45¼	LR	11.75	2535	Penny
84 W. K.-1916	1¾	35¼	F	9.75	2537	Pilgrim
84 W. K.-1916	2	50	LR	18.50	2538	Pistol
84 W. K.-1916	2	20	UR	7.75	2539	Plate
75-1916-75-B, 1917-18	1¾	35¼	F	8.00	2540	Plow
75-1916-75-B, 1917-18	2	41	R	15.25	2541	Pluck
90, Country Club	Same as 75-					
85-Four, 85-Six, 1917-18	1¾	35½	F	11.75	2544	Pedestal
85-Four, 85-Six, 1917-18	2¼	46½	R	24.00	2545	Penance
90 Touring 17-18	1¾	35¼	Ft	8.50	2546	Perform
PAIGE-DETROIT						
36-1912-13, 1¾" wide	1¾	33	F	7.25	6006	Quiet
36-1912-13	2	37¼	LR	11.75	6007	Quince
36-1912-13	2	37¾	UR	13.25	6008	Quinine
36-14-15, 2" wide	2	33⅝	F	8.50	6009	Quire
36-1914-15	2	37	LR	12.00	6010	Quiver
36-1914-15	2	37¼	UR	12.75	6011	Quote
6-46-1915		35½	F	10.50	6012	Quaint
6-38-1916-17, 6-39-18	2¼	35¾	F	9.75	6013	Question
6-38-39, 16-17-18	2¼	42⅝	R	16.50	6014	Quintel
6-38, 16-17 Rdstr.		43	R	15.75	6015	Quaff
6-46, 16-17 Trg	2	36¼	F	12.25	6016	Quarry
6-46, 16-17 Rdstr.	2	36	F	14.50	6017	Quadrant
6-46, 1915-16-17	2½	48¼	R	24.00	6018	Quoit
PULLMAN						
Junior, 1915	1¾	33½	F	8.00	6100	Quadrille
Junior, 1916-17	1¾	33½	F	8.00	6101	Quaggy
Junior, 1916-17			R	30.00	6102	Quagmire
R. C. H.						
Rdstr. or Tour'g	1½	32½	F	6.50	2600	Queen
REO						
Fifth, 1912	2	38	F	12.00	2807	Scorn
Fifth, 1913-14	2	38	F	12.50	2808	Sedate
Fifth, 1912-13-14-15-16-17	2	43¾	LR	12.75	2809	Select
Fifth, 1912-13-14-15-16	2	25	UR	8.00	2810	Senate
Fifth, 15-16-17	2	37¼	F	10.50	2813	Sentry
Six, 1915-16-17	2	37¼	F	12.75	2814	Serpent
Six, 1915-16-17	2	49	R	22.25	2818	Sheaf
Four, 1918	2	37¼	FT.	10.50	2813	Sentry
Four, 1918	2	51¾	R	20.75	2820	Shelter
REO TRUCK						
"J," 2 tons	2¼	43¼	F	21.25	2811	Senator
"J," 2 tons	2½	41¼	R	27.75	2812	Sensation
1500-lb. Truck	2	37¼	F	12.75	2814	Serpent
1500-lb. Truck	2¼	39	R	18.00	2819	Shear
REPUBLIC TRUCKS						
F-¾-ton, Inc. 15	2¼	44	R	28.50	2851	Serenade
C & M, 1½-ton	2¼	37½	F	14.50	2852	Sermon
C & M, 1½-ton	2¼	43	R	25.00	2853	Shawl
A-2-ton, Inc. 16-17	2¼	37¼	F	18.00	2854	Severe
A-2-ton, Inc. 16-17	3	52	R	63.25	2855	Shaker
F-¾-ton, 15-16-17	2¼	36½	F	16.00	2856	Shadow
F-¾-ton, 16-17	2¼	51½	R	31.00	2857	Shanty
SAXON						
4-cylinder			F	5.00	6050	Separate
4-cylinder			R	5.00	6051	Sequel
6-cylinder			F	12.00	6052	Sketch
6-cylinder			R	12.00	6053	Sleigh
6-1917-18	2¼	41½	R	20.00	6054	Sliding
SCRIPPS-BOOTH						
1915-16-17	1½	29½	F	5.75	2750	Slipper
1915-16	1½	24	R	5.50	2751	Sluggard
1918	1½	31	R	9.25	2752	Slush
SMITH FORM-A-TRUCK						
1916-17, 9 leaf	2	42	S	19.25	2050	Scabbard
1916-17, 10 leaf	2	42	S	20.50	2051	Scald
1916-17, 11 leaf	2	42	S	22.00	2052	Scamper
1916-17, 12 leaf	2	42	S	24.00	2053	Scepter
1916-17, 56" Tread	2	31½	R	6.50	2054	Scholar
1916-17, 60" Tread			R	6.50	2055	Sculptor
STUDEBAKER						
25-1913	1¾	36	F	8.75	2900	Talent
25-1913	1¾	34½	LR	8.00	2901	Talon
25-1913	1¾	35	UR	8.75	2902	Tangle
35-1913	2	37½	F	12.50	2903	Tape
35-1913	2	49	LR	16.50	2904	Tardy
35-1913	2	20	UR	8.00	2905	Tackle
4-B-1914-15	2	37½	F	9.25	2906	Tailor
4-B-1914-15	2	37	LR	10.50	2907	Tanned
4-B-1914-15	2	36	UR	11.50	2908	Tandem
6-B-1914-15	2	37¼	F	10.50	2909	Tarnish
6-B-1914-15	2	48½	LR	15.75	2910	Tarry
6-B-1914-15	2	20¾	UR	8.00	2911	Tartar
4-1916-17-18	2	37½	F	10.00	2918	Tenant
4-1916-17-18	2	47¾	LR	14.00	2919	Testify
4-1916-6-1916	2	18½	UR	5.75	2920	Textile
6-1916-17-18	2	37½	F	10.75	2921	Tassel
6-16-17, 4-17-18	2	47½	LR	16.50	2922	Target
6-1917-18	2	18½	UR	7.25	2923	Tango
VIM TRUCK						
Vim	2	35	F	11.25	4175	Vapor
Vim	2	45½	R	16.00	4176	Vegetate

JENKINS VULCAN SPRING CO., RICHMOND, INDIANA

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"The Spring Is the Thing"

MATHER SPRINGS

Scientifically Heat-Treated
designed to insure
Maximum of Elasticity & Endurance
with
Minimum of Vibration

Genuine made only by
The Mather Spring Company
Toledo, Ohio.

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SPRINGS, Leaf (Continued)

Sheldon Axle & Spring Co., Wilkes-Barre, Pa. (See pages 402 and 403.)
Spring Perch Co., 232 John St., Bridgeport, Conn.
Standard Parts Co., Cleveland, O. "Perfection." (See pages 408 and 409.)
Standard Steel Spring Co., Coraopolis, Pa.
Stanley—See National Spring Co.
Sterling Spring Co., 2148-62 Scranton Rd., Cleveland, O.
Superior Steel Spring Co., Mt. Clemens, Mich.
Temme—See Triple Action Spring Co.
Titanic—See Tuthill Spring Co.
Triple Action Spring Co., 55-67 E. 28th St., Chicago, Ill. "Temme." (See page 637.)
Troy Spring Works, 394-96 Congress St., Troy, N. Y.
Tuthill Spring Co., 760 Polk St., Chicago, Ill. "Titanic." (See page 635.)
Vulcan—See Jenkins Vulcan Spring Co.
Western Spring & Axle Co., Garfield Bldg., Detroit, Mich.

SPRINGS, Special Leaf, for Fords

(Including elliptic, semi-elliptic and cantilever springs to replace regular springs)

Garden City Spring Works, 2300 Archer Ave., Chicago, Ill. "Ralco."
Higgins Spring & Axle Co., Dept. 1015 Racine, Wis. (See page 639.)
Ralco—See Garden City Spring Works.
Rest-More Spring Co., 912 Douglas St., Ottawa, Ill.
Swartwout Do-It Spring Co., 7 E. 42d St., New York, N. Y.
Temme—See Triple Action Spring Co.
Triple Action Spring Co., 55-67 E. 28th St., Chicago, Ill. "Temme." (See page 637.)

SPRINGS, Machinery or Coil

American Spiral Spring & Mfg. Co., 56th & Butler Sts., Pittsburgh, Pa.
American Steel Spring Co., Chicago, Ill.
American Steel & Wire Co., Chicago, Ill. (See page 203.)
Barnes Co., Wallace, Wallace & Parallel Sts., Bristol, Conn.
Cary Spring Works, 240 W. 29th St., New York, N. Y.
Chatillon & Sons, John, 85-93 Cliff St., New York, N. Y.
Cleveland Wire Spring Co., Cleveland, O.
Cook Spring Co., 420 E. 106th St., New York, N. Y.
Cuyahoga Spring Co., 16600 Waterloo Rd., Cleveland, O.
Dunbar Bros. Co., Bristol, Conn.
Eagle—See Miller & Van Winkle.
Eureka Spring Co., 347 W. Broadway, New York, N. Y.
Fisher Spring Co., Chas., 88-90 Walker St., New York, N. Y.
Gardner Wire Co., 5648 Race Ave., Chicago, Ill.
General Spring & Wire Co., 550 Marston Ave., Detroit, Mich.
Gibson Co., William D., 1800 Clybourn Ave., Chicago, Ill. (See page 641.)
Hebb, George A., 70 William St., Newark, N. J.
Hubbard Spring Mfg. Co., Pontiac, Mich. (See page 781.)
Miller Wire Spring Co., Bridgeport, Conn.
Miller & Van Winkle, 18 Bridge St., Brooklyn, N. Y. "Eagle."
Mitchell Spring Works, W. G., Johnstown, Pa.
Moesta & Ruehwein, Hulbert Blk., Cincinnati, O.
Morgan Spring Co., W. Boylston St., Worcester, Mass.
New York Wire & Spring Co., 586-88 Washington St., New York, N. Y. (See page 641.)
Peck & Young Mfg. Co., Forestville, Conn.
Railway Steel-Spring Co., 30 Church St., New York, N. Y.
Raymond Mfg. Co., W. Church St., Corry, Pa.
Sabin Machine Co., Montpelier, Vt.
Tuck Mfg. Co., 74 Ames St., Brockton, Mass.
United Spring Co., 241 Centre St., New York, N. Y.
Webb Mfg. Co., ft. Center St., Newark, N. J. (See page 715.)
Wilson, Robert P., 20 Clinton St., Newark, N. J.

SPRINGS, Seat or Upholstery

American Cushion Spring Co., Kalamazoo, Mich.
American Steel Spring Co., Chicago, Ill.
American Steel & Wire Co., Chicago, Ill. (See page 203.)
Barber Mfg. Co., Anderson, Ind.
Black Velvet—See National Spring & Wire Co.
Champion—See Wing Co.
D'Arcy Spring Co., Kalamazoo, Mich. (See page 655.)
Dean Wire Goods Co., 180 Austin Ave., Worcester, Mass.
Excelsior—See Trenton Spring Mattress Co.
Foster Bros. Mfg. Co., 311 Broad St., Utica, N. Y.
Gibson Co., Wm. D., 1800 Clybourn Ave., Chicago, Ill. (See page 641.)
Hemm Clutch Spring Co., 115 N. Main St., Piqua, O.
Jackson Cushion Spring Co., Jackson, Mich. "Rough Rider." (See page 653.)
Kelley & Co., E., 4 Cherry St., Worcester, Mass.
Lace Web—See Trenton Spring Mattress Co.
Marshall Ventilated Mattress Co., 1454 S. Sangamon St., Chicago, Ill.
Miller Wire Spring Co., Bridgeport, Conn.
Miller & Van Winkle, 18 Bridge St., Brooklyn, N. Y.
Morgan Spring Co., W. Boylston St., Worcester, Mass.
Murray Spring Co., Wm. A., 132 Sycamore St., Cincinnati, O.
National Spring & Wire Co., Albion, Mich. "Black Velvet," "Rocky Road."
Perfection Coil Spring Co., 233 E. Main St., Jackson, Mich.
Rocky Road—See National Spring & Wire Co.
Rough Rider—See Jackson Cushion Spring Co.
Sagless Auto Seat Co., 7717 S. Halsted St., Chicago, Ill.
Simmons Mfg. Co., Kenosha, Wis.
Staples & Hanford Co., Newburgh, N. Y.
Trenton Spring Mattress Co., Parker Ave., Trenton, N. J. "Excelsior," Lace Web."
Vincent-Alward Co., Market & Howland Sts., Kenosha, Wis.
Wing Co., Charles, Amesbury, Mass. "Champion." (See page 645.)
Young Industries, L. A., Westminster & Russel Sts., Detroit, Mich.

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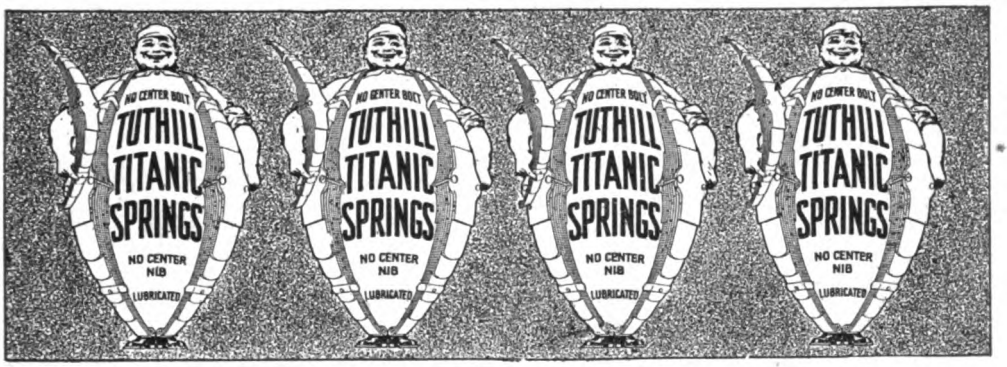


Distributors—Tuthill Titanic Springs

Albany	Albany Hardware & Iron Co.
Atlanta	Elyea-Austell Co.
Baltimore	Baltimore Hub-Wheel & Mfg. Co.
Billings	Barry Motor Company
Birmingham	Moore-Handley Hardware Co.
Boston	Post & Lester Co.
Buffalo	H. D. Taylor Co.
Charleston	The Cameron & Barkley Co.
Charlotte	Carolinas Auto Supply House
Chicago	All Jobbers
Cincinnati	The Ohio Rubber Co.
Cleveland	Cray Brothers
Columbus	Griswold-Sohl Co.
Dallas	Fisk Company of Texas
Davenport	Sieg Company
Dayton	S. T. & G. A. Gebhart Co.
Denver	Auto Equipment Co.
Detroit	Tuthill Spring Product Co.
Des Moines	Herring Motor Co.
Duluth	Kelley-How-Thompson Co.
El Paso	Western Motor Supply Co.
Evansville	Orr Iron Co.
Fargo	J. D. Grant
Flint	Cumings Brothers
Florence	D. W. Alderman, Jr.
Fresno	Chanslor & Lyon Co.
Grand Rapids	Sherwood Hall Co.
Hartford	Post & Lester Co.
Houston	Fisk Company of Texas
Indianapolis	W. J. Holliday & Co.
Jacksonville	American Supply Co.
Kansas City	Faeth Iron Co.
Kansas City	Motor & Machinist Supply Co.
Lincoln	Nebraska Buick Auto Co.
Los Angeles	Chanslor & Lyon Co.
Louisville	Andrew Cowan & Co.
Memphis	Ozburn Automobile Supply Co.
Milwaukee	Babcock Auto Spring Co.
Minneapolis	Western Motor Supply Co.
Nashville	Auto Supply Co.
New Orleans	Interstate Electric Co.
New York	W. E. Pruden Hardware Co.
Oakland	Chanslor & Lyon Co.
Omaha	Powell Supply Co.
Peoria	Nat'l Electric & Auto Supply Co.
Philadelphia	Manufacturers' Supply Co.
Pocatello	Salt Lake Hardware Co.
Portland	Chanslor & Lyon Co.
Quincy	Reid Motor Co.
Richmond, Va	Chemi Company
Rochester	Sidney B. Roby Co.
Salt Lake City	Salt Lake Hardware Co.
St. Louis	Auto Devices Company
San Antonio	Fisk Co. of Texas
San Francisco	Chanslor & Lyon Co.
Seattle	Chanslor & Lyon Co.
Sioux City	Sioux City Iron Co.
Spokane	Chanslor & Lyon Co.
Tacoma	Chanslor & Lyon Co.
Tampa	The American Supply Co.
Toledo	Union Supply Co.
Washington	Charles Rubel & Co.
Wichita	Shattuck-George Iron Co.

Be a Home Guard of Steel

Steel is now the world's most precious metal in winning the war. Every pound used for non-essential purpose makes the Government war program that much less effective.

Tuthill Titanic distributors are fully co-operating with the War Industries Board—the duty is personal and cannot be delegated to others.

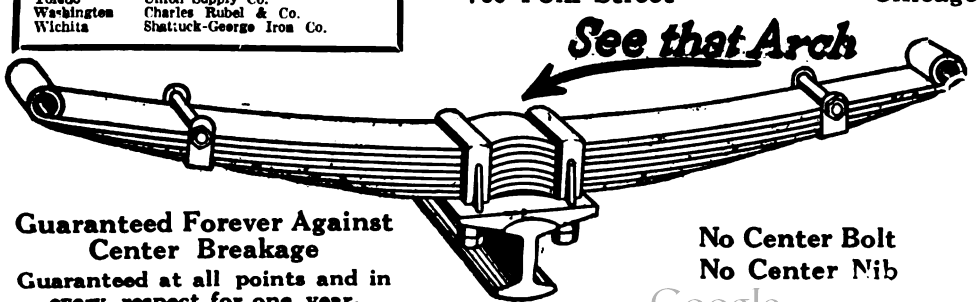
Every precaution should be taken by dealers in the distribution of automotive springs to see that they are used only for essential purposes.

Motorists should avoid spring breakage and consequent steel wastage by driving conservatively—not overloading—taking the bumps easy—keeping the spring clips tightened. HELP WIN THE WAR.

TUTHILL SPRING CO.

Established 1880

760 Polk Street **Chicago**



Guaranteed Forever Against Center Breakage

Guaranteed at all points and in every respect for one year.

No Center Bolt
No Center Nib

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SPRINGS, STEERING GEAR—See Checks, Steering Gear

SPRINGS, Supplementary

(See also Shock Absorbers; also Straps, Rebound)

Alta—See Temco Electric Motor Co.

Auto Accessory Mfty., 84 Depot St., Canisteo, N. Y. "Eureka."

Axwell Equipment Co., 214 Wood St., Pittsburgh, Pa.

Blackledge Mfg. Co., John W., 341 E. Ohio St., Chicago, Ill. "Velvet."

Buckeye—See Central Brass & Fixture Co.

C-C—See Cox Brass Mfg. Co.

C. M.—See Crescent Mfg. Co.

Central Brass & Fixture Co., Dept. A., Springfield, O. "Buckeye." (See page 137.)

Climax Shock Absorber Co., Benton Harbor, Mich.

Cox Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y. "Coxajusto," "C-C."

Coxajusto—See Cox Brass Mfg. Co.

Crescent Mfg. Co., 129 Reade St., New York, N. Y. "C. M."

Curtis—See Garden City Spring Works.

Eureka—See Auto Accessories Mfty.

Falkenhainer & Co., 313 Carr St., St. Louis, Mo. "Ri-D-Z."

Featheride—See Roche Electric Mfg. Co.

Fernald Shock Absorbing Spring Suspension Co., 170 Summer St., Boston, Mass.

Fox Pneumatic Shock Absorber Co., Broad & Race Sts., Philadelphia, Pa.

Garden City Spring Works, 2300 Archer Ave., Chicago, Ill. "Curtis."

Halladay Co., L. P., 501 N. Monroe St., Streator, Ill.

Hartford, Edward V., 172 Morgan St., Jersey City, N. J. (See page 607.)

Headlight Support Co., 728 Woodward Ave., Detroit, Mich.

Hoover Spring Co., 617-37 Turk St., San Francisco, Cal.

J. M. Shock Absorber Co., 250 W. 54th St., New York, N. Y.

Johnson—See Triple Action Spring Co.

K. T. Lever Spring Co., 332 W. 70th St., New York, N. Y.

Keystone—See Steel City Electric Co.

Kim Mfg. Co., Merrimac, Mass.

King-Flex—See Vehicle Specialty Co.

Marvel Machinery Co., 1301 S. Third St., Minneapolis, Minn.

McGregor—See U. S. Auto Bumper Co.

Noxal Co., 29 S. Clinton St., Chicago, Ill.

Ri-D-Z—See Falkenhainer & Co.

Right Motor Specialties Co., 1326 Michigan Ave., Chicago, Ill.

Roche Electric Mfg. Co., 215-17 N. Division Ave., Grand Rapids, Mich. "Featheride."

Sager Co., J. H., 36-38 S. Water St., Rochester, N. Y.

St. Louis Supplementary Spiral Spring Co., 4523 Delmar Ave., St. Louis, Mo.

Steel City Electric Co., 1207 Columbus Ave., Pittsburgh, Pa. "Keystone."

Stone-Thompson Mfg. Co., 1502 Michigan Ave., Chicago, Ill. (See page 577.)

Temco Electric Motor Co., Leipsic, O. "Alta."

Triple Action Spring Co., 55-67 E. 28th St., Chicago, Ill. "Johnson." (See page 637.)

Twin Spring Co., 1000 Boylston St., Boston, Mass.

U. S. Auto Bumper Co., 115 E. 30th St., Chicago, Ill. "McGregor."

United States Spring Co., 1120-26 S. Los Angeles St., Los Angeles, Cal.

Universal Shock Eliminator, 6-8 W. 62d St., New York, N. Y.

Vehicle Specialty Co., 26 State St., Hartford, Conn. "King-Flex."

Velvet—See Blackledge Mfg. Co.

SPRINGS, Supplementary, for Fords

(See also Shock Absorbers; also Straps, Rebound)

Alexander & Cox Co., Ogden & Western Aves., Chicago, Ill.

Altorfer Bros. Co., Peoria, Ill. "Parnells."

B B.—See Bayne Mfg. Co.

Badger Mfg. Corp., Milwaukee, Wis. (See page 139.)

Bayne Mfg. Co., Grant & Davis Sts., Bushnell, Ill. "B B."

Blackledge Mfg. Co., John W., 341 E. Ohio St., Chicago, Ill. "Velvet."

Brown Co., 213 Bellevue Ave., Syracuse, N. Y. "None-Such."

Buckeye De Luxe—See Central Brass & Fixture Co.

Burgess Mfg. Co.—See Zinke Co.

Burpee-Johnson Co., Hume-Mansur Bldg., Indianapolis, Ind. "Float-a-Ford."

C-W—See Crum-Wiley Mfg. Co.

Carr, H. G., 910 E. Main st., Hoopestown, Ill. "X L."

Central Brass & Fixture Co., Dept. A., Springfield, O. "Buckeye De Luxe." (See page 137.)

Champion Shock Absorber Sales Co., Indianapolis, Ind. (See page 239.)

Comfort Shock Absorber Co., Hempstead, N. Y.

Cox Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y.

Crum-Wiley Mfg. Co., Peru, Ind. "C-W."

Dotti Mfg. Co., Madison, Wis. (See page 643.)

Duplex Cantilever Spring Co., 180 N. Dearborn St., Chicago, Ill. (See page 637.)

Eclipse—See Kanesteo Mfg. Co.

Flexible Rider—See R. & R. Mfg. Co.

Flexlever—See Halladay Co.

Float-a-Ford—See Burpee-Johnson Co.

Ford Relief Spring & Frame Supporter Co., 7 E. 42d St., New York, N. Y.

Fordexer—See Walker Mfg. Co.

G-A—See General Appliance Co.

General Appliance Co., 19th St. & Western Ave., Chicago, Ill. "G-A."

Grau Shock Absorber Co., 328 River St., Chicago, Ill.

H. & D. Co., Goodland, Ind.

Halladay Co., L. P., 501 N. Monroe St., Streator, Ill. "Flexlever."

Handee—See Racine Handy Mfg. Co.

Harper Buggy Co., Columbia City, Ind.

Hartford, Edward V., 172 Morgan St., Jersey City, N. J. (See page 607.)

Hassler, Robt. H., 1535 Naomi St., Indianapolis, Ind.

Hoffman Mfg. Co., Andrew, 5034-38 S. State St., Chicago, Ill.

Home Light Co., 3353 Milwaukee Ave., Chicago, Ill.

Humboldt Machine & Stamping Co., 81-85 Tenth St., Long Island City, N. Y. "Ridewell," "Little Giant."

Hyway—See Staff & Eckhouse.

J. M. Shock Absorber Co., 250 W. 54th St., New York, N. Y.

Johnson—See Triple Action Spring Co.

K-W Ignition Co., 2900 Chester Ave., Cleveland, O. (See page 449.)

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TEMME SPRINGS

Triple Action Quality

FOR ALL AUTOMOBILES AND TRUCKS

All TEMME springs are made in direct accordance with the automobile manufacturers' specifications, regarding dimensions and carrying capacities. They are constructed of the highest grade crucible steel, each leaf hand fitted and oil tempered. A constant stock of over 60,000 springs for all makes and models of cars enables us to make immediate shipment.

PRICES are lower than those made by the car manufacturers. 3500 Official Service Stations in effect now.

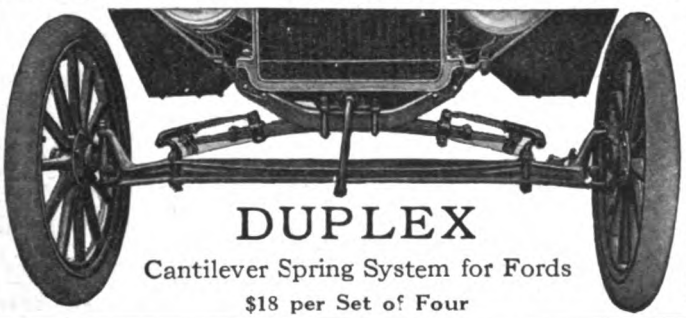
Write at once for proposition for 1918.

TRIPLE ACTION SPRING COMPANY

Manufacturers of the JOHNSON SHOCK ABSORBER

55 to 67 East 28th Street Chicago, Illinois

DEMAND HEAVIER THAN EVER!



DUPLEX

Cantilever Spring System for Fords

$18 per Set of Four

Big business growing bigger. Ford owners taking better care of cars—insist on Duplex Cantilever System. Safest. Most satisfactory. Positive protection against rough road vibration. Only Cantilever System for Fords. Easily installed. Fully guaranteed. Write quick for prices and profitable dealer's proposition.

Duplex Cantilever Spring Co.
180 N. Dearborn St., Chicago, Ill.

Here's The Trade-Mark That Buyers Of Automobile Springs Are Learning To Look For

Harvey RACINE

The Harvey trade-mark is our guarantee of quality and means extreme limit in auto spring service. It protects the dealer and repairman, too, for it means that we, the manufacturers, must maintain the high standard we have established for Harvey Springs. These good springs are a live, money-making proposition for any dealer or repairman who wants to increase his spring replacement business—and profits. If you don't know our jobber in your territory, write for his name at once.

Harvey RACINE

Springs Do Not Break

They are made of the finest selected steel, have no weak spots and are guaranteed from end to end. If a spring proves defective at any point we will replace it. Harvey springs are made in sizes for practically every make and model of car. Each spring is an exact duplicate of the spring it is intended to replace and fits with an accuracy that will surprise you.

You owe it to your customers—to your own best business judgment to sell springs of recognized merit. Harvey springs meet every demand for wear and service and give absolute satisfaction to the car owner.

FREE

Every Dealer, Garageman and Repairman should write for the Harvey Auto Spring Book which contains a complete list of springs for all the leading makes and models of cars. Gives sizes, weights, measurements, prices, and other valuable information about automobile springs that has never been published before. It is a quick and ready reference book and an invaluable aid in ordering replacements. We mail it free.

Send for the new Harvey Auto Spring Catalog No. 4 just off Press.

HARVEY SPRING CO.
854 17th St., RACINE, WIS.

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SPRINGS, Supplementary, for Fords (Continued)

Kanesteo Mfg. Co., Main St., Canisteo, N. Y. "Eclipse."

Keystone—See Steel City Electric Co.

Kim Mfg. Co., Merrimac, Mass.

Little Giant—See Humboldt Machine & Stamping Co.

Luxry Shock Absorber Co., Cincinnati, O.

New Era Spring & Specialty Co., 1138 Hamilton St., N. W., Grand Rapids, Mich. (See page 355.)

None-Such—See Brown Co.

Par Kop Mfg. Co., 1522-24 Ingersoll St., Philadelphia, Pa.

Parnells—See Altorfer Bros. Co.

Perfection Shock Absorber Co., 25 E. Grand Ave., Chippewa Falls, Wis.

Pratt Mfg. Co., Wm. E., 35 W. Lake St., Chicago, Ill.

R-M-S—See Right Motor Specialties Co.

R. & R. Mfg. Co., 208 S. La Salle St., Chicago, Ill. "Flexible Rider."

Racine Handy Mfg. Co., 107 Fifth St., Racine, Wis. "Handee."

Rex—See Volute Spring Shock Absorber Co.

Richards-Wilcox Mfg. Co., Third St. & C. B. & Q. R. R. Tracks, Aurora, Ill.

Ridewell—See Humboldt Machine & Stamping Co.

Right Motor Specialties Co., 1326 Michigan Ave., Chicago, Ill. "R-M-S."

Roadmaker—See Turner Brass Works.

Sager Co., J. H., 36-38 S. Water St., Rochester, N. Y.

Staff & Eckhouse, 1432 S. Michigan Ave., Chicago, Ill. "Hyway." (See page 529.)

Star—See Union Elevator & Machine Co.

Star Specialty Mfg. Co., 227-33 W. Erie St., Chicago, Ill. "W. X."

Steelbilt—See Walker Mfg. Co.

Steel City Electric Co., 1207 Columbus Ave., Pittsburgh, Pa. "Keystone."

Stone-Thompson Mfg. Co., 1502 Michigan Ave., Chicago, Ill. (See page 577.)

Sturges Co., V. K., 26th & Union Sts., Oakland, Cal.

Superb Mfg. Co., 100 Main St., Remington, Ind.

Temco Electric Motor Co., Leipsic, O.

Triple Action Spring Co., 55-67 E. 28th St., Chicago, Ill. "Johnson." (See page 639.)

Turner Brass Works, Sycamore, Ill. "Roadmaker."

Twin Spring Co., 1000 Boylston St., Boston, Mass.

U. S.—See B. & L. Auto Lamp Co.

Union Elevator & Machine Co., 227 W. Erie St., Chicago, Ill. "Star."

Van Briggle Motor Device Co., 427 N. Capitol Ave., Indianapolis, Ind.

Velvet—See Blackledge Mfg. Co.

Volute Spring Shock Absorber Co., Mt. Vernon, N. Y. "Rex."

W-X—See Star Specialty Mfg. Co.

W. & C.—See Webber & Co.

Walker Mfg. Co., Hamilton & Michigan Sts., Racine, Wis. "Fordezer," "Steelbilt."

Wardway Vehicle Works, Chicago Heights, Ill. (See page 715.)

Webber & Co., Philip H., Hoopeston, Ill. "W. & C." (See page 609.)

Whitehouse-LeCompte Mfg. Co., 42-54 Elm St., Newark, N. J.

Winger Blume Mfg. Co., Wolcott, Ind.

X. L.—See Carr, H. G.

Zinke Co., 1323-25 Michigan Ave., Chicago, Ill. (Sole Distributors for Burgess Mfg. Co., St. Joseph, Mich.)

SPRINGS, TIRE CHAIN TIGHTENING—See Tighteners, Tire Chain

SPRINGS, Tow Rope

Zimmerman's Garage, 247 W. Main St., Valparaiso, Ind.

SPRINGS, UPHOLSTERY—See Springs, Seat

SPRINGS, VALVE—See Springs, Machinery

SPRINGS, VALVE, FOR FORDS—See Springs, Engine Valve

SPROCKETS, Machined

(For Sprocket Blanks—See Castings; also Forgings; also Gears, Blank)

Baldwin Chain & Mfg. Co., Worcester, Mass. (See page 179.)

Billings & Spencer Co., Laurel & Park Sts., Hartford, Conn.

Boston Gear Works (Norfolk Downs), Quincy, Mass. (See page 319.)

Crofoot Gear Works, 31 Ames St., Cambridge, Mass. (See page 319.)

Cullman Wheel Co., 1356 Altgeld St., Chicago, Ill. (See page 687.)

Diamond Chain & Mfg. Co., Kentucky Ave., Indianapolis, Ind.

Forg, Peter, 50 Park St., Somerville, Mass.

Link-Belt Co., 732 Dime Bank Bldg., Detroit, Mich. (See page 171.)

Meisel Press Mfg. Co., 945 Dorchester Ave., Boston, Mass. (See page 319.)

Pennsylvania Gear & Machine Co., 435 N. Broad St., Philadelphia, Pa. (See page 357.)

Savage Arms Corp., Sharon, Pa. (See page 213.)

Sier-Bath Co., 143 W. 54th St., New York, N. Y. (See page 357.)

SPROCKETS, Motorcycle

Hydraulic Pressed Steel Co., 3180 E. 61st St., Cleveland, O. (See page 297.)

STABILIZERS, Aeroplane

Martin Aeroplane Factory, Elyria, O.

Sperry Gyroscope Co., Brooklyn, N. Y.

STAKE POCKETS—See Pockets, Truck Stake

STAMPINGS and Pressings, Metal

A. B. & B. Specialty Co., 764 Windlake Ave., Milwaukee, Wis.

A. C. R.—See American Cloth Register Co.

Acklin Stamping Co., 1645 Dorr St., Toledo, O.

Acme Motor Parts, 1454 Eighth Ave., Milwaukee, Wis.

Adell Mfg. Co., Orange, Mass.

Advance Machinery Co., Van Wert, O.

Akron-Selle Co., High & Chestnut Sts., Akron, O.

Aluminum Co. of America, Pittsburgh, Pa.

Amco—See Automotive Mfg. Co.

American Brass Novelty Co., Grand Haven, Mich.

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STAMPINGS and Pressings, Metal (Continued)

American Cloth Register Co., 189 Main St., New Britain, Conn. "A. C. R."

American Steel Spring Co., Chicago, Ill.

American Tube Co., 37th & Rockwell Sts., Chicago, Ill.

American Tube & Stamping Co., 471 Hancock Ave., Bridgeport, Conn.

Ashley Machine Works, 721 University Ave., Rochester, N. Y.

Automotive Mfg. Co., Dime Bank Bldg., Detroit, Mich. "Amco."

Bassick Co., 381 Austin St., Bridgeport, Conn.

Bay State Stamping Co., 380 Chandler St., Worcester, Mass.

Betco—See Blodgett Engineering & Tool Co.

Bettcher Mfg. Co., 58th St. & P. C. C. R. R., Cleveland, O.

Bilton Machine Tool Co., 990 Housatonic Ave., Bridgeport, Conn.

Blair Tool & Machine Works, 521 Greenwich St., New York, N. Y.

Blodgett Engineering & Tool Co., Fort & Beaubien Sts., Detroit, Mich. "Betco."

Board, Edward, Seventh & Wood Sts., Philadelphia, Pa.

Bossert Corp., Utica, N. Y. (See page 363.)

Boston Pressed Metal Co., 175 Union St., Worcester, Mass.

Bowen Products Corp., Auburn Division, Auburn, N. Y. (See page 237.)

Brewer-Tichener Corp., 115 Port Watson St., Cortland, N. Y.

Browne Mfg. Co., W. G., Kingston, N. Y.

Budd & Ranney Mfg. Co., Columbus, O.

Buffalo Metal Products Mfg. Co., 373-85 E. Delevan St., Buffalo, N. Y.

Buffalo Pressed Steel Co., Buffalo, N. Y. (See page 473.)

Burr Mfg. Co., 1100 Power Ave., Cleveland, O.

C. A. S. Engineering Co., 790 Woodward Ave., Detroit, Mich. (Sole Distributors for Regenstein-Veeder Stampings.)

Capital Die, Tool & Machine Co., 619-21 N. Fourth St., Columbus, O.

Carde Stamping & Tool Co., West Side, Saginaw, Mich.

Cassady-Fairbank Mfg. Co., 6106-30 La Salle St., Chicago, Ill.

Central Machine Works, 12th & Tyler Sts., St. Louis, Mo.

Century Telephone Construction Co., Buffalo, N. Y.

Chicago-Racine Aluminum, Brass & Iron Works, 224-30 W. Huron St., Chicago, Ill.

City Iron Works & Machine Co., 520 S. Delaware Ave., Philadelphia, Pa.

Clayton & Lambert Mfg. Co., Detroit, Mich. (See page 743.)

Cleveland Stamping & Tool Co., Cleveland, O.

Cleveland Wrought Products Co., 3590 W. 58th Ct., Cleveland, O.

Cornwall Mfg. Co., E. 128th St. & Penobscot Ave., Cleveland, O.

Crosby Co., Buffalo, N. Y. (See page 669.)

Crowe Name Plate & Engraving Co., Chicago, Ill. (See page 461.)

Custer Pressed Steel Wheel Co., Bradford, Pa.

Dall Steel Products Co., Hosmer & Main Sts., Lansing, Mich.

Detroit Auto Specialty Co., 909-11 Greenwood Ave., Detroit, Mich.

Detroit Metal Products Co., Ford Bldg., Detroit, Mich.

Detroit Pressed Steel Co., Detroit, Mich. (See page 365.)

Detroit Stamping Co., 951-57 W. Fort St., Detroit, Mich.

Diamond Stamping Works Co., 5400 Windsor Ave., Cleveland, O.

Disston & Sons, Henry, (Tacony), Philadelphia, Pa.

Dunkirk Corp., 16 E. Second St., Dunkirk, N. Y.

Eagle Stamping Co., 1410 Niagara St., Buffalo, N. Y.

Eastern Machine & Stamping Co., 15 Wickenden St., Providence, R. I.

Eastern Production Co., 137 Leib St., Detroit, Mich. (See page 345.)

Eisler Mfg. Co., Rochester, N. Y.

England Mfg. Co., 1559 Jefferson Ave., W., Detroit, Mich.

Enterprise Mfg. Co., Ash & Main Sts., Akron, O.

Erie Metal Products Co., Erie, Pa. (See page 523.)

Everett Mfg. Co., 162-64 N. May St., Chicago, Ill.

Fanner Mfg. Co., Brookside Pk., Cleveland, O.

Federal Pressed Steel Co., Keefe Ave. & N. Pierce St., Milwaukee, Wis.

Fernald Mfg. Co., North East, Pa.

Ferro Stamping & Mfg. Co., 287-97 Franklin St., Detroit, Mich.

Forg, Peter, 50 Park St., Somerville, Mass.

Forsyth Bros. Co., McCormick Bldg., Chicago, Ill.

Fort Dearborn Mfg. Co., Sterling, Ill.

Fostoria Pressed Steel Co., Fostoria, O.

Fox Co., Gustave, 411-13 Race St., Cincinnati, O.

Frankford Machine Co., 4099 Frankford St., Philadelphia, Pa.

Gasket Supply Co., 1728 Ludlow St., Philadelphia, Pa. (See page 439.)

Gem Mfg. Co., Goebel & Fulton Sts., Pittsburgh, Pa.

Gem Stamped Steel Co. (Chelsea Station), Boston, Mass.

General Metals Co., 265 E. Jefferson Ave., Detroit, Mich.

Geuder, Paeschke & Frey Co., 1422-1700 St. Paul Ave., Milwaukee, Wis. (See page 679.)

Gier Pressed Steel Co., Lansing, Mich. (See page 505.)

Globe Machine & Stamping Co., 1250 W. 76th St., Cleveland, O.

Gray & Sons, Peter, 300 Third St., Cambridge, Mass.

Greer, Frederic, 525 W. Van Buren St., Chicago, Ill.

Hale-Kilburn Corp., 18th St. & Glenwood Ave., Philadelphia, Pa.

Hamilton & De Loss, Bridgeport, Conn.

Harding & Co., 122 S. Michigan Ave., Chicago, Ill. (See page 261.)

Hardy Mfg. Co., Pendleton, Ind. (See page 335.)

Hastings Mfg. Co., Hastings, Mich.

Hawthorne Mfg. Co., Bridgeport, Conn.

Hayes-Ionia Co., Grand Rapids, Mich.

Hero Mfg. Co., Gaul & Adams Sts., Philadelphia, Pa.

Higginson-Gibson Mfg. Co., 74 Atlantic St., Boston, Mass.

Hill Co., Geo. Q., 32-34 Dorchester Ave., Boston, Mass.

Hoeft & Co., Ashland Ave. & Kinzie St., Chicago, Ill.

Hotchkiss Metal Form Co., 16 Jarvis St., Binghamton, N. Y.

Hubbard Spring Mfg. Co., Pontiac, Mich. (See page 781.)

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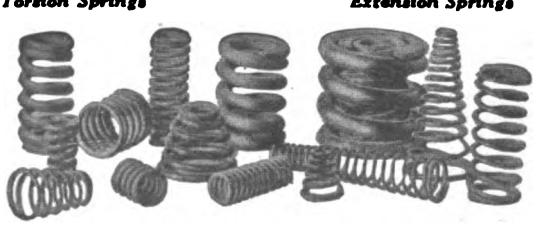

STAMPINGS and Pressings, Metal (Continued)

Hunt & Dorman Mfg. Co., 1600 E. 24th St., Cleveland, O.
Hydraulic Pressed Steel Co., 3180 E. 61st St., Cleveland, O. (See page 297.)
Indestructible Wheel Co., Lebanon, Ind.
Industrial Electric Mfg. Co., 139 Beaubien St., Detroit, Mich.
International Metal Mfg. Co. (Wayne Junction), Philadelphia, Pa.
Ireland & Matthews Mfg. Co., Beard & Chatfield Sts., Detroit, Mich.
Jambor Mfg. Co., 911 Center St., Milwaukee, Wis. (See page 429.)
Johnson Mfg. Co., 103 N. Front St., Philadelphia, Pa.
Kales Stamping Co., 443-59 Lafayette Blvd., Detroit, Mich.
Keeler Brass Co., 261-71 Godfrey Ave., Grand Rapids, Mich.
Keyless Lock Co., 1401 Newman St., Indianapolis, Ind.
Kickhaefer Mfg. Co., 199-201 Oregon St., Milwaukee, Wis. (See page 785.)
Kitchen Specialty Mfg. Co., Elm & Reed Sts., Reading, Pa.
Konigslow Mfg. Co., Otto E., 3701 Perkins Ave., Cleveland, O.
Krasberg Mfg. Co., 536 Lake Shore Drive, Chicago, Ill.
Lansing Stamping & Tool Co., Lansing, Mich.
Lawrie Co., Fred'k S., Odd Fellows Bldg., Indianapolis, Ind. (Sales Agents.) (See page 867.)
Lawson Co., F. H., Dept. D., Cincinnati, O. (See page 663.)
Liberty Metal Spinning Works, 180 Centre St., New York, N. Y.
Lindholm Metal Stamping Co., 107-15 Erie St., Camden, N. J. (See page 351.)
Lightwell Steel Sash Co., Newport, Del.
McCord Mfg. Co., Detroit, Mich. (See pages 558 and 559.)
McDowell Mfg. Co., 541 Wood St., Pittsburgh, Pa.
Maforco—See Market Forge Co.
Mann Corp., Kankakee, Ill.
Market Forge Co., Garvey St. & Blvd., Everett, Mass. "Maforco."
Matthews Mfg. Co., 104 Gold St., Worcester, Mass.
Matthews Mfg. Co., H. A., Seymour, Conn.
Metal Auto Parts Co., Industrial Bldg., Indianapolis, Ind.
Metal Specialty Co., Cincinnati, O.
Metropolitan Mfg. Co., Oakman Ave. & Detroit Terminal R. R., Detroit, Mich. (See page 641.)
Michigan Crown Fender Co., Ypsilanti, Mich.
Michigan Metal Spinning Mfg. Co., Woodbridge St., Detroit, Mich.
Michigan Stamping Co., Mack Ave. & Detroit Terminal, Detroit, Mich.
Mitchell & Son, G. F., 6501 Cedar Ave., Cleveland, O.
Moline Pressed Steel Co., East Moline, Ill.
Monarch Stamping Co., Chappaqua, N. Y.
Morgan Spring Co., W. Boylston St., Worcester, Mass.
Mossberg Co., Frank, Attleboro, Mass. (See page 769.)
Motors Metal Mfg. Co., Milford Ave. & P. M. R. R., Detroit, Mich.
Motor Parts Machine Co., 645-49 S. Pierce St., Milwaukee, Wis.
Mullins Co., W. H., 182 Franklin St., Salem, O.
Murray Mfg. Co., J. W., Clay & St. Aubin Aves., Detroit, Mich.
National Engineering Co., Liberty Bldg., Philadelphia, Pa.
National Spring Bed Co., New Britain, Conn.
National Stamping & Electric Works, 410-26 Clinton St., Chicago, Ill.
Neevel Mfg. Co., 1409 Kansas Ave., Kansas City, Mo.
New Britain Machine Co., 10 Bigelow St., New Britain, Conn. (See page 659.)
Newark Stamping & Foundry Co., Newark, O.
Niagara Falls Metal Stamping Works, 245 Tenth St., Niagara Falls, N. Y.
Oakes Co., Indianapolis, Ind. (See page 279.)
Oliver Metal Stamping Co., 217-23 W. Illinois St., Chicago, Ill.
Osborne & Stephenson Mfg. Co., Plainville, Conn.
Parish Mfg. Co., Reading, Pa. (See page 541.)
Parish & Bingham Co., Cleveland, O. (See page 295.)
Parker White-Metal & Machine Co., Erie, Pa. (See page 655.)
Parsons Mfg. Co., Detroit, Mich.
Pennsylvania Stamping Co., York, Pa.
Perfect Window Regulator Co., 20 Exchange Pl., New York, N. Y. (See page 569.)
Presteel Co., Grafton, O.
Pressed Aluminum Co., 3 Cypress St., Worcester, Mass.
Pressed Steel Co., N. Pennsylvania Ave., (North Wilkes-Barre) Wilkes-Barre, Pa.
Pressed Steel Tank Co., Greenfield Ave., West Allis, Wis.
Quinsigamond Pressed Steel Co., 62 Jackson St., Worcester, Mass.
R. P. K. Pressed Metal Co., Bridgeport, Conn.
Ramsdell Specialty Co., W. Boylston St., Worcester, Mass.
Raymond Engineering Corp., 305 Lafayette St., New York, N. Y.
Regenstein-Veeder Co.—See C. A. S. Engineering Co.
Rochester Pressed Steel Co., 35-37 Ford St., Rochester, N. Y.
Royal Enameling & Mfg. Co., 326 W. Madison St., Chicago, Ill.
Russ Co., W. 58th St. & Walworth Ave., Cleveland, O.
S. A. Machine Co., Detroit, Mich. (See page 429.)
S. & I. Co., 55-57 Governor St., Springfield, Mass.
Saxon Mfg. Co., 1034-40 Grand Ave., Toledo, O.
Schatz Mfg. Co., 17 Fairview Ave., Poughkeepsie, N. Y.
Schloemer Mfg. Co., 388-92 Division St., Oshkosh, Wis.
Schroeder Bros. Mfg. Co., 110 Brook St., Torington, Conn.
Scovill Mfg. Co., Waterbury, Conn. (See page 659.)
Sears-Cross Co., Bush Terminal, Brooklyn, N. Y.
Sessions & Son, J. H., Bristol, Conn.
Shapiro & Aronson, 20 Warren St., New York, N. Y.
Smith Co., Thomas, 13 Cypress St., Worcester, Mass.
Smith Corp., A. O., Milwaukee, Wis. (See page 343.)
Solar Metal Products Co., 470 Starr Ave., Columbus, O.
Spafford Machine Screw Works, 586 Asylum St., Hartford, Conn.
Special Machinery Co., 183 John St., Bridgeport, Conn.
Spiro Mfg. Co., C., 68-72 E. 131st St., New York, N. Y.
Spring Snap Fastener Co., Lynn, Mass.
Stamping & Tool Co., Third & Cass Sts., La Crosse, Wis.

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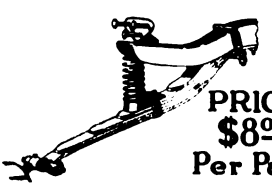

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Standard Metal Mfg. Co., 237 Chestnut St., Newark, N. J.
Standard Metal Spinning Co., 138 Mott St., New York, N. Y.
Standard Steel Box Co., Bridgeville, Pa.
Standard Tool & Mfg. Co., 68-72 E. Lafayette Ave., Detroit, Mich.
Stanley Works, New Britain, Conn. (See page 347.)
Star Machine & Tool Co., 433 Champlain Ave., Cleveland, O.
Stearns Stamping Co., W. H., 34 Southbridge St., Worcester, Mass.
Steel Furniture Co., 1480 Buchanan Ave., S. W., Grand Rapids, Mich.
Steger & Sons Industrial Works, Steger, Ill.
Sterling Metal Parts Co., 495 Broadway, Milwaukee, Wis.
Superior Metal Products Co., Elyria, O. (See page 755.)
Syracuse Stamping Co., 1056 S. Clinton St., Syracuse, N. Y.
Tiffin Art Metal Co., Tiffin, O.
Toledo Steel Barrel Co., Toledo, O.
Transue & Williams Steel Forging Corp., 580 W. Ely St., Alliance, O. (See page 571.)
Triumph Mfg. Co., Kansas City, Mo.
Trumbull, F. S., Bishop & Conn. Aves., Bridgeport, Conn.
Tuttle & Bailey Mfg. Co., 52 Vanderbilt Ave., New York, N. Y.
Unique Findings & Supply Co., Providence, R. I.
Variety Mfg. Co., 340-52 N. Sacramento Blvd., Chicago, Ill.
Varley Mfg. Co., Findlay, O.
Villinger Mfg. Co., 643 Elmira Ave., Williamsport, Pa.
Voelkner & Harry Mfg. Co., 282-92 Woodbridge St., E., Detroit, Mich.
Vogel & Bros., Wm., 433 Kent Ave., Brooklyn, N. Y.
Wagner Mfg. Co., E. R., North Milwaukee, Wis. (See page 645.)
Walker-Wells Co., Amesbury, Mass.
Walsham Co., Josiah, 48 Dudley St., Providence, R. I.
Western Metal Specialty Co., 406 Broadway, Milwaukee, Wis.
Wheeler Reflector Co., 154 Pearl St., Boston, Mass.
Wheeler & Son, Frank, 55 Stone St., Meriden, Conn.
Wilcox Co., W. W., 1713-35 Armitage Ave., Chicago, Ill.
Worcester Pressed Steel Co., Worcester, Mass.
Worcester Stamped Metal Co., Worcester, Mass. (See page 665.)
Xardell Bros. Co., 28 Broadway, Utica, N. Y.
Youngstown Pressed Steel Co. (E. Youngstown), Youngstown, O.
York Corrugating Co., York, Pa.
Ziegler Mfg. Co., 216 S. Central Ave., Alexandria, Ind.
Zenite Metal Co., 201-05 N. West St., Indianapolis, Ind. (See page 469.)

STAMPS, Steel

(For numbering or lettering Parts)

Becker Engraving Co., August, 247 Atlantic Ave., Boston, Mass.
Bloch Metal Stamping Co., 88-90 Walker St., New York, N. Y.
Brookes & Co., E. J., 227 Fulton St., New York, N. Y.
Chandler Co., Napier St., Springfield, Mass.
Hanson Co., C. H., 178 N. Clark St., Chicago, Ill.
Hoggson & Pettis Mfg. Co., New Haven, Conn.
Kautz & Co., Fred C., 2633-35 W. Lake St., Chicago, Ill.
Knight & Son, H. W., Seneca Falls, N. Y.
McNamara, M., 85 Nassau St., New York, N. Y.
Matthews & Co., Jas. H., Pennant Way, Pittsburgh, Pa.
Mayer Co., Geo. J., 36 S. Meridian St., Indianapolis, Ind.
Murdoch, Jr., Co., Jas., 116 Opera Pl., Cincinnati, O.
Ness, Jr., Geo., M., 61 Fulton St., New York, N. Y.
New York Stencil Works, 100 Nassau St., New York, N. Y.
Noble & Westbrook Mfg. Co., 9 Asylum St., Hartford, Conn.
Robbins Mfg. Co., John, 58 Kneeland St., Boston, Mass.
Schwerdtle Stamp Co., 39-41 Cannon St., Bridgeport, Conn.
Wright & Son, Greg. G., 119-21 Opera Pl., Cincinnati, O.

STAMPS, Time

Automatic Time Stamp Co., 160 Congress St., Boston, Mass. (See page 645.)
Calculagraph Co., 30 Church St., New York, N. Y.
Cosmo—See Joslin Mfg. Co.
Eclipse—See Joslin Mfg. Co.
Follett Time Recording Co., 29 Murray St., New York, N. Y.
Hoggson & Co., S. H., Thames Bldg., New York, N. Y.
Joslin Mfg. Co., A. D., 233 W. Erie St., Chicago, Ill. "Cosmos," "Eclipse."

STANDS, Aircraft Propeller Vise

Fay & Egan Co., J. A., 415 W. Front St., Cincinnati, O.

STANDS, AXLE, FOR FORDS—See Stands, Rear Axle

STANDS, LIGHT—See Lights, Wash Stand

STANDS, Motor Repair

Amelung Mfg. Co., A. F., Sanborn, Ia.
Buckeye—See Central Brass & Fixture Co.
Central Brass & Fixture Co., Dept. A. Springfield, O. "Buckeye." (See page 137.)
Continental Auto Parts Co., Knightstown, Ind
Dolder Mfg. Co., Earlville, Ill.
Dyer Co., G. H., Cambridge, Mass. (See page 505.)
Haco—See Hathorn Auto Co.
Hathorn Auto Co., Mason City, Ia. "Haco."
Manley—See United Engine & Mfg. Co.
Nonpareil Mfg. Co., Cochranton, Pa.
St. Albans Foundry & Implement Co., St. Albans, Vt.
Service Station Equipment Co., 1201 Cortland St., Chicago, Ill.
Shewalter Mfg. Co., 1217 Phythian St., Springfield, O. "Universal."
United Engine & Mfg. Co., Hanover, Pa. "Manley." (See page 537.)
Universal—See Shewalter Mfg. Co.
Wilber, Charles, 14 W. 28th St., Minneapolis, Minn.

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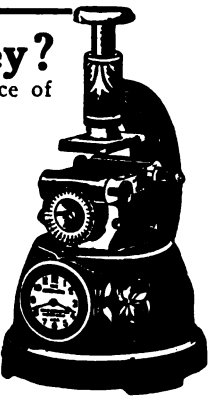

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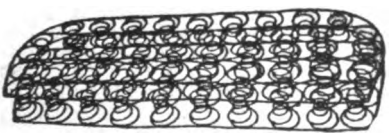

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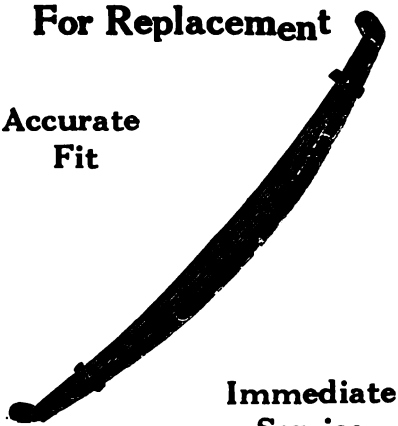

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Carswell-Hammond Mfg. Co., 819-21 Tenth St., Boone, Ia.

Danielson Engine Works, Jackson Blvd. & Canal St., Chicago, Ill.

Eco—See Western Mfg. Co.

Ekern Bros. Mfg. Co., Flandreau, S. Dak.

Miles & Co., E. J., Newton, Ia. (See page 485.)

Motax Mfg. Co., Taylorville, Ill.

Nelson & Son, T. K., 606 Hill St., Harlan, Ia.

Nonpareil Mfg. Co., Cochranton, Pa.

Spencer & Nelson, Lake View, Ia.

Western Mfg. Co., Oskaloosa, Ia. "Eco."

STANDS, Portable Tool

Acme Sheet Metal & Mfg. Co., 2343 Lakeside Ave., Cleveland, O.

Dyer Co., G. H., Cambridge, Mass. (See page 505.)

Lucas & Son, J. L., 3 Fox St., Bridgeport, Conn.

Manley—See United Engine & Mfg. Co.

New Britain Machine Co., 10 Bigelow St., New Britain, Conn. (See page 659.)

United Engine & Mfg. Co., Hanover, Pa. "Manley." (See page 239.)

Western Tool & Mfg. Co., Springfield, O.

STANDS, Rear Axle Repair, for Fords

Carswell-Hammond Mfg. Co., 819-21 Tenth St., Boone, Ia.

Miles & Co., E. J., Newton, Ia. (See page 485.)

STANDS, REPAIR—See Stands, Motor Repair; also Stands, Portable Tool; also Stands, Rear Axle Repair

STANDS, WASH STAND LIGHT—See Lights, Wash Stand

STANDS, TOOL—See Stands, Portable Tool

STAPLES, Insulated

(Fibre insulated staples for car wiring)

Blake Signal & Mfg. Co., 251 Causeway St., Boston, Mass. (See page 721.)

STARTER BRUSHES—See Brushes, Magneto, Starter and Generator

STARTER BUSHINGS — See Bushings, Starter or Primer Attaching

STARTER COILS—See Windings, Starter and Ignition

STARTER GEARS, AUTOMATIC—See Gears, Automatic Starter Transmission

STARTER SWITCHES—See Switches, Electric Starter

STARTER WINDINGS — See Windings, Starter and Ignition

STARTERS, Acetylene Gas Engine

Polson Mfg. Co., 1754 Main St., Buffalo, N. Y.

STARTERS, Aeroplane Compressed Air Engine

Christensen Engineering Co., First National Bank Bldg., Milwaukee, Wis.

Motor Compressor Co., 52-60 Dickerson St., Newark, N. J. "Perfect."

Perfect—See Motor Compressor Co.

STARTERS, AIR—See Starters, Compressed Air

STARTERS, Compressed Air Engine

Christensen Engineering Co., First National Bank Bldg., Milwaukee, Wis.

G. & M.—See Goodwin & Miles Co.

Goodwin & Miles Co., 241 Sansome St., San Francisco, Cal. "G. & M."

Ham-Meix Mfg. Co., W. 11th St. & Belt Railroad, Indianapolis, Ind. "H. & M."

H & M—See Ham-Meix Mfg. Co.

Lipman Air Appliance Co., 206 Pleasant St., Beloit, Wis.

Shimpf Starter Co., 114 State St., Boston, Mass.

Smith, Irvin C., 355 S. Los Angeles St., Los Angeles, Cal.

Standard Appliance Co., Trust Co. Bldg., Franklin, Pa.

STARTERS, Compressed Air Engine, for Fords

Aero—See Newstarter Mfg. Co.

Air Device Co., 2975-77 Cottage Grove Ave., Chicago, Ill. "Ten Eyck."

Airgo—See General Appliance Co.

General Appliance Co., Penobscot Bldg., Detroit, Mich. "Airgo."

Kellogg Mfg. Co., Rochester, N. Y. (See page 533.)

Newstarter Mfg. Co., 1901 South Western Ave., Chicago, Ill. "Aero."

Stewart-Warner Speedometer Corp., Chicago, Ill. (See page 499.)

Ten Eyck—See Air Device Mfg. Co.

STARTERS, Electric Engine

Auto-Lite—See Electric Auto-Lite Corp.

Bijur Motor Lighting Co., 15th St. & River Front, Hoboken, N. J.

Dayton Engineering Laboratories Co., 329 E. First St., Dayton, O. "Delco."

Delco—See Dayton Engineering Laboratories Co.

Dyneto Electric Corp., Syracuse, N. Y. (See page 269.)

Electric Auto-Lite Corp., Toledo, O. "Auto-Lite." (See pages 647 to 650.)

Gray & Davis, Boston, Mass. (See page 651.)

Heinze Co., John O., Springfield, O. (See page 653.)

Huff—See Simms Magneto Co.

Kemco Electric Mfg. Co., Salem, O.

L-N—See Leece-Neville Co.

Leece-Neville Co., 5363 Hamilton Ave., Cleveland, O. "L-N."

North East Electric Co., Rochester, N. Y. (See pages 265 to 268.)

Remy Electric Co., 1623 E. Grand Blvd., Detroit, Mich.

Simms Magneto Co., 277 N. Arlington Ave., East Orange, N. J. "Huff."

Wagner Electric Mfg. Co., 6400 Plymouth Ave., St. Louis, Mo.

Wells Mfg. Co., R. C., Fond du Lac, Wis.

Westinghouse Electric & Mfg. Co., 110-14 W. 42nd St., New York, N. Y. (See page 667.)

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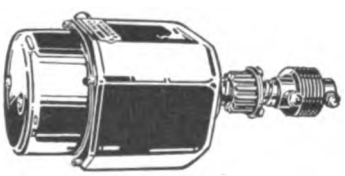
The Electric Auto-Lite Company

The World's Largest Makers of Starting, Lighting and Ignition Systems for Motor Cars



The Highest Electrical Efficiency

No mechanical or electrical device has ever been invented or manufactured which will not at some time require attention or some slight adjustment.

We believe, however, that the Highest Electrical Efficiency has been reached in the Auto-Lite system—and that troubles if experienced at all will be few.

But considering the fact that the average motorist knows little about the care of electrical apparatus, we would make the following suggestions:

In case of difficulty with the electrical equipment try to locate the particular part that is giving the trouble before sending in a complaint.

Carefully test such parts as are suspected of giving trouble. This will save you both time and money. Our experience shows troubles are often blamed on the Auto-Lite equipment when some other part is at fault.

Our instruction booklet giving detailed directions for the proper care of the system will be sent free upon request.

Electric Auto-Lite Corp., Toledo, O.

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Complete List of Electric

SPECIAL FACTORY REPRESENTATIVES

1016 U. S. Rubber Bldg., New York City, N. Y.
1475 Bush St., San Francisco, Calif.
1527 Grand Ave., Kansas City, Mo.

ALABAMA: Birmingham	The Electric Garage & Repair Co., 2016 Ave. B.
Mobile	Mobile Electric Garage, 210 N. Royal St.
ARIZONA: Globe	Schweitzer Machine Co.
Kingman	Schweitzer Machine Co.
Nogales	Schweitzer Machine Co.
Phoenix	Schweitzer Machine Co.
Tuscon	Schweitzer Machine Co., P. O. Box 87
Yuma	Schweitzer Machine Co.
ARKANSAS: Fort Smith	Electric Service Co., 109 N. 10th St.
Little Rock	Brown & Holland, 324 W. 6th St.
CALIFORNIA: El Centre	C. E. Coggins, 409 Main St.
Exeter	Central Calif. Electric Co.
Fresno	Western Auto Electric Co., 1444 Van Ness Ave.
Glendale	Western Auto Electric Co., 437 Broadway
Hanford	Phil Shellabarger, 214 N. Irwin St.
Lindsay	Central Calif. Electric Co., 182 N. Sweet Briar Ave.
Los Angeles	Western Auto Electric Corp., 440 West Pico St.
Marysville	Auto Electric Battery Co., 301 E. St.
Modesto	Frank Andrews, 712 9th St.
Oakland	Motor Electrical Specialty Co., 3963 Piedmont Ave.
Pasadena	Western Auto-Electric Co., Colorado and Pasadena Aves.
Riverside	Mission Auto Electric Service, 450 Main St.
Sacramento	Graham & Lamus, 711 M. St.
Salinas	Eaton's Auto Repair Shop.
San Diego	J. Stanley Lasha, 1251 4th St.
San Francisco	Electric Auto-Lite Corp., 1143 Post St.
San Francisco	Motor Electrical Specialty Co., 1143 Post St.
San Jose	Auto Ignition Co., 345 1st Ave.
San Luis Obispo	San Luis Auto Electric Works, 987 Osos St.
Santa Ana	Orange Co., Ignition Works, Inc.
Santa Barbara	Guarantee Battery Starter & Lighting Co., 407 State St.
Santa Monica	Western Auto Electric Co., 315 Utah St.
Stockton	W. L. Maxwell Co., 207 N. El Dorado St.
Turlock	Mission Garage.
COLORADO: Denver	Electric Service & Engineering Co., 1313 Broadway
Fort Morgan	Williams Battery Service.
CONNECTICUT: Bridgeport	Auto Electric Service & Supply Co., 334 Hanover St.
Hartford	Mr. Robert R. Ashwell, 341 Trumbull St.
New Haven	New Haven Electric Co., 50 Crown St.
New London	Garlock & Haynes Co., 108 Main St.
DELAWARE: Wilmington	Wilmington Storage Battery Co., 219 French St.
DIST. COLUMBIA: Washington	Miller-Dudley Co., 1625 14th St., N. W.
FLORIDA: Gainesville	Voyle Brothers, 207 E. Main St.
Jacksonville	The Magneto Exchange, 221 West Adams St.
Miami	The Electric Garage Co., 320 13th St.
Tampa	Pierce Bros. Garage, 115 Parker St.
GEORGIA: Atlanta	Southern Auto & Equipment Co., Office 92 S. Forsyth St.
IDAHO: Boise	Bertram Motor Supply Co., 121 S. 10th St.
ILLINOIS: Bloomington	Auto Battery & Electric Co, 104 N. Prairie St.
Galesburg	Electrical Service Co.
Peoria	Electrical Testing Co., 350 Knoxville Ave.
Springfield	Chapin Electric Garage, 407 E. Jackson
Chicago	Electric Auto-Lite Service Station, 1241 Michigan Ave.
INDIANA: Indianapolis	The H. T. Electric Co., 617 N. Capital Ave.
Logansport	I. R. Redinger Co., Inc., 126 6th St.
Peru	Peru Cycle Exchange, 19-21 East Main St.
Richmond	Richmond Electric Co., 1107 Main St.
South Bend	South Bend Ignition Co., 108 W. Monroe St.
Vincennes	Meyers Motor Electric Co.
Winamac	Galbreath Brothers.
IOWA: Burlington	Hedges Battery Works, 405 Valley St.
Cedar Rapids	Monroe Battery Co., 2nd St. and 4th Ave.
Davenport	A. B. Johnson, 114 Brady St.
Des Moines	Bernhard & Turner Automobile Co., 506 West 7th St.
Dubuque	Dubuque Exide Battery Station, 16 18th St.
Grinnell	Bidwell Electric Co.
Sigourney	Friday Machinery & Supply Co.
Sioux City	Arthur Electric Service, 715 Pearl St.
Waterloo	Standard Battery Service Co., 111 E. 5th St.
KANSAS: Arkansas City	Mears Bros., 407 S. Summit St.
Chanute	K W Battery Co., 16 S. Highland Ave.
Clay Center	Miller Co., 4th and Lincoln Sts.
Hutchinson	E. H. Helms Electric Co., 20 Sherman West.
Pratt	Mills Electric Co.
Salina	Jesse O. Spray, 213 N. 5th St.
Topeka	Machinists Electric Co., 108 W. 8th Ave.
Wichita	The Goodin Motor & Truck Co., 323 S. Lawrence Ave.
KENTUCKY: Louisville	Rommel-Smith Motor Co., 901 E. Broadway

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Auto-Lite Service Stations

LOUISIANA: New Orleans	Coln & Suhren, 901 Carondelet St.
Shreveport	Lloyd Battery Co.
MAINE: Portland	L. W. Cleveland Co., 441 Congress St.
MARYLAND: Baltimore	Richardson Auto Electric Corp., Lafayette and Charles Sts.
MASSACHUSETTS: Boston	Wm. H. Flaherty Co., 74 Cummington St.
Fitchburg	Jenkins & Robinson, 42 Day St.
New Bedford	Auto Electric Service Station, Pleasant and Kempton Sts.
Springfield	Krohnes Service Station, 59 Pecousic Ave.
Worcester	Jenkins & Robinson, 69 Central St.
MICHIGAN: Detroit	Auto Electric & Service Corp., 11 Selden Ave.
Flint	Flint Storage Battery & Electric Co., 116 E. Union St.
Grand Rapids	Leon S. Heth Company, 225 Bond Ave., N. W.
Lansing	Barker-Cole Electric Co., 114 N. Grand Ave.
Port Huron	Paton Electric Service Co., 325 Water St.
Saginaw	The Trombley Electric Co., 521 Tuscola St.
MINNESOTA: Duluth	Kelley Hardware Co.
Minneapolis	Reinhard Bros. Co., Inc., 11 S. 9th St.
St. Paul	The Essanell Electric Co., 126 W. 6th St.
MISSOURI: Kansas City	Electric Products Co., 1717 McGee St.
Kansas City	Electric Auto-Lite Corporation, 1717-19 McGee St.
St. Joseph	Electric Products Co., 1009 Francis St.
St. Louis	S. G. Hoffman Magneto Co., 1026 N. Pendelton Ave.
Springfield	Auto Electric Service Co., 421 W. Walnut St.
MONTANA: Billings	Electric Service Station, 12 N. 29th St.
Butte	Auto Electric Equipment Co., Arizona and Front Sts.
Great Falls	Auto Electrical Equipment Co., 707 Central Ave.
Helena	Valliant & Houston, 138 N. Jackson St.
Missoula	Montana Motor Co., 107 Pattee St.
NEBRASKA: Hastings	Geo. W. Kimball, Jr., 104 Lincoln Ave., N.
Lincoln	Randall & Noll, 317 S. 11th St.
Omaha	Auto Electric Service Co., 316 S. 19th St.
NEVADA: Goldfield	Brown-Parker Auto Co.
Reno	Brown & Milbery, 4th and Sierra Sts.
Tonopah	Tonopah Electric & Tire Co.
NEW HAMPSHIRE: Manchester	E. E. Austin, 123 Canal St.
NEW JERSEY: Newark	P. J. Durham Co., Inc., 235 Central Ave.
Trenton	Barber & Hearnen, Inc., 105-7 S. Warren St.
NEW MEXICO: Albuquerque	McCloskey Automobile Co., 408 W. Copper St.
Deming	Deming Storage Battery Co.
NEW YORK: Albany	Autolectric Equipment & Repair Co., 61 Central Ave.
Binghamton	Elco Engineering Co., 239 Water St.
Brooklyn	P. J. Durham Co., Inc., 761 Park Place.
Buffalo	Meinhard Auto Service Co., Inc., Main and Virginia Sts.
Jamestown	Rathbun Electric Service Co., 207 Pine St.
New York City	Electric Auto-Lite Corp., 402 U. S. Rubber Bldg.
New York City	P. J. Durham Co.,Inc., 244 West 49th St.
Oneida	Mr. Chas. L. Lloyd, 123 Main St.
Poughkeepsie	Pease Electric Service, 27 New Market St.
Rochester	Starter & Ignition Service Co., 437 Main St. E.
Syracuse	E. Q. Williams, 525 S. Clinton St.
Utica	Stiefvater Electric Co., Inc., 412 Seneca St.
NORTH CAROLINA: Asheville	Asheville Battery Co.
Raleigh	Marson & Woodall, 411 Fayettville St.
NORTH DAKOTA: Fargo	Howard B. Tilden, 71 5th St. N.
OHIO: Akron	A. M. Allen Electric Co., 293 Water St.
Canton	Canton Engineering & Electric Co., Cor. Cleveland and 5th Sts.
Cincinnati	Boyle Engineering Co., 1042 Gilbert St.
Cleveland	Auto Battery & Starter Service Co., 1661 E. 81st St.
Columbus	Auto Electrical Supply Co., 231 N. 5th St.
Dayton	L. C. R. Storage Battery Co., 122 N. St. Clair St.
Orrville	Orrville Electric & Storage Battery Co.
Springfield	The Electric Service Station, 142 W. Main St.
Youngstown	Youngstown Motor Equipment Co., 1744 Market St.
OKLAHOMA: Enid	Enid Auto Electric Co.
Lawton	Fields Garage, 419 C. Ave.
Muskogee	Muskogee Garage, 624 W. Okmulgee Ave.
Oklahoma City	The Metropolitan Garage, 5th St. and Robinson Ave.
Tulsa	Auto Repair & Ignition Co., 305 E. 3rd St.
OREGON: Medford	C. E. Gates Auto Co., Cor. Riverside and Main Sts., Sparta Bldg.
Pendleton	Wm. E. Chase Engineering Co., 320 East Court St.
Portland	Gibson Electric Garage, Alder at 12th Sts.
Salem	Auto Electric Service Co., 148 S. Commercial St.
PENNSYLVANIA: Allentown	Auto Electric Co., 12 N. Centre Square
Erie	Electric Battery & Construction Co., 206 West 12th St.
Harrisburgh	Zimmerman Auto Repair Co., 17th and Kelley Sts.
Philadelphia	Auto Equipment & Service Co., 1435 Vine St.
Pittsburgh	Penn Storage Battery Co., 5986 Center Ave.
RHODE ISLAND: Providence	A. F. Maille Electric Co., 24 Garnet St.
SO. CAROLINA: Charleston	Gas Engine & Electric Co., 174 King St.
Columbia	Auto Electric Co., 1216 Hampton Ave.
SOUTH DAKOTA: Aberdeen	Aberdeen Engineering Co., 14-16 2nd Ave., S. E.
Huron	Mower Auto Electric Co., Third Door East of James Valley Bank.
Rapid City	E. T. Shmucker, 508 Main St.
Sioux Falls	Pryde Electric Co.
Watertown	Hanson Auto Electric Co., 119 3rd St., N. E.

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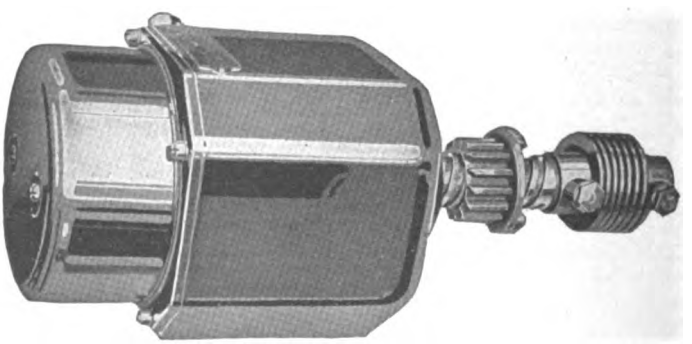
TENNESSEE: Knoxville	McNutt & Co., 813 S. Gay St.
Memphis	Storage Battery Service & Sales Co., 47 S. 3rd St.
Nashville	Automobile Electric Service Co., 714 Commerce St.
TEXAS: Abilene	Carter's Auto Repair Shop, 5th and Pine Sts.
Amarillo	Auto-Lite Service Station, 108 West 6th St.
Austin	T. L. Gray, 7th and Colorado Sts.
Beaumont	Beaumont Electric Co.
Corsicana	Corsicana Battery & Starter Co., 211 West Collin St.
Dallas	Delco & Auto-Lite Service Station, 1805 Commerce St.
El Paso	Western Battery & Magneto Co., 314 E. Blvd. St.
Fort Worth	Starter Service Co., 826 Monroe St.
Houston	Houston Storage Battery Co., 1111 Main St.
Paris	Paris Battery & Electric Co.
Plainview	G. C. Electric Co.
San Angelo	Ragsdale Auto Supply Co., 8 Concho Ave.
San Antonio	S. X. Callahan, 419 N. Flores St.
Sherman	Roberts Electric Co.
Wichita Falls	Electric Service Station, 813 Scott St.
UTAH: Salt Lake City	Mr. Karl Winters, 717 S. State St.
VIRGINIA: Norfolk	Reliance Electric Co., 711 Granby St.
Richmond	Electric Service Co., 721 W. Broad St.
WASHINGTON: Everett	Ellarson's Battery Shop, 2819 Hoyt Ave.
North Yakima	Hillman Electric Co., 5 S. 3rd St.
Seattle	Sunset Electric Co., 606 E. Pike St.
Spokane	Wm. E. Chase Engineering Co., S. 221-223 Monroe St.
Tacoma	Auto Electric Service Co., 115 S. 8th St.
Walla Walla	Walla Walla Auto Electric Co., 21 West Alder St.
WEST VIRGINIA: Wheeling	McKelvey-Ewing Electrical Co., 937 Market St.
WISCONSIN: La Crosse	Benton Electric Co., 106 Pear St.
Madison	Brady-Littlewood Co., 323 West Johnson St.
Milwaukee	Lemko Electric Co., 509 Cedar St.

CANADA

ALBERTA: Calgary	Electric Service Co., 311 17th Ave., W.
BRITISH COL.: Vancouver	The Battery House, 808 Pender St. W.
MANITOBA: Winnipeg	Acme Electrical Co., 276 Fort St.
NEW BRUNSWICK: St. John	Ottie S. McIntyre, 54 Sydney St.
NOVA SCOTIA: Halifax	Tucker & Day, 17 1-2 South St.
ONTARIO: Hamilton	Toronto & Hamilton Electric Co., Ltd., 99-103 McNab St., N.
Ottawa	The Ottawa Storage Battery Co., 218 Albert St.
Toronto	The Auto Electric Service Co., Ltd., Garage, 8-10 Elm St., Office, 72 Victoria St.
QUEBEC: Montreal	Fehr Bros., 172 Bleury St.
Quebec	Mr. Louis Lavoie, 173 Bridge St.
Sherbrooke	Wiggett's Battery Service Station, 71 Wellington St.
SASKATCHEWAN: Regina	Motor Supplies, Ltd., 1824 Cornwall St.
Saskatoon	Saskatoon General Electric Co.
TERRITORY OF HONOLULU:	
Honolulu	Smoot & Steinhauser.

Electric Auto-Lite

STARTING — LIGHTING — IGNITION



Auto-Lite M. F. Motor with Bendix Drive

The First Six-Volt System

Electric Auto-Lite Corp., Toledo, O.

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GRAY & DAVIS

Starter for Ford Cars

SUCCESSFULLY IN USE *on* THOUSANDS *of* FORDS EVERYWHERE

GRAY & DAVIS DISTRIBUTORS:

Atlanta, Ga.	Ozburn Abston Co.	397 Peachtree St.
Baltimore, Md.	Eugene I. Rosenfeld Co.	325 W. Baltimore St.
Boston, Mass.	Lalime & Partridge, Inc.	405 Boylston St.
Buffalo, N. Y.	Meinhard Auto Supply Co.	846 Main St.
Carroll, Iowa	Swaney Auto Co.	
Charleston, W. Va.	Triple State Electric Co.	16 McFarland St.
Chicago, Ill.	U. S. Auto Supply Co.	3845 Wabash Ave.
Cincinnati, Ohio	Ohio Rubber Co.	228 West Seventh St.
Cleveland, Ohio	C. Z. Sedgley	1010 Chestnut Ave.
Columbus, Ohio	Justus & Parker Co.	129 East Gay St.
Des Moines, Iowa	Herzing	
Detroit, Mich.	Fred E. Holmes Co.	1602 Woodward Ave.
Fort Dodge, Iowa	Swaney Auto Co.	618 First Ave., North
Hartford, Conn.	Elmer Automobile Co.	Cor Church & Trumbull Sts.
Indianapolis, Ind.	The W. R. Wheeler Co.	426 North Meridian St.
Kansas City, Mo.	Kansas City Automobile Sup. Co.	1504 Grand Ave.
Los Angeles, Cal.	Weinstock-Nichols Co.	
Louisville, Ky.	Ozburn Abston Co.	661 South Fourth St.
Memphis, Tenn.	Ozburn Abston Co.	Monroe Ave., at Third St.
Milwaukee, Wis.	Lemke Electric Co.	509 Cedar St.
Minneapolis, Minn.	Reinhard Bros. Co.	14 East Eighth St.
New Orleans, La.	Interstate Electric Co.	Baronne & Perdido Sts.
New York City	P. J. Durham Co.	244 West 49th St.
Newark, N. J.	P. J. Durham Co.	235 Central Ave.
Omaha, Neb.	Auto Electric Service Co.	316 South 19th St.
Parkersburg, W. Va.	H. P. Dils & Son	211 Sixth St.
Philadelphia, Pa.	J. H. McCullough & Son	219 North Broad St.
Pittsburgh, Pa.	Penn Storage Battery Co.	5986 Center Ave., E. End
Portland, Oregon	Ballou & Wright	Broadway at Oak
Providence, R. I.	Dutee Wilcox Flint	17 Snow St.
Rochester, N. Y.	J. Lawrence Hill Co.	21 Plymouth Ave.
Salt Lake City, Utah	Inter-Mountain Elec. Co.	43-59 E. Fourth St., South
San Antonio, Texas	Universal Car Co.	
San Francisco, Cal.	Weinstock-Nichols Co.	538-546 Golden Gate Ave.
Seattle, Wash.	Ballou & Wright	817 East Pike St.
Sioux City, Iowa	William Warnock Co.	
Spokane, Wash.	Auto Ignition & Speedometer Co.	1405 First Ave.
St. Louis, Mo.	Fred Campbell Auto Supply Co.	1909 Locust St.
Tampa, Florida	D. F. Owen Co.	219 Franklin St.
Tulsa, Oklahoma	Walsh & Johnson	
Utica, N. Y.	Utica Cycle & Supply Co.	117 Columbia St.
Washington, D. C.	Chas. Rubel & Co.	1621 L. St., N.W.
Windsor, Ontario, Can.	Universal Car Agency	Chatham & Ferry Sts.

GRAY & DAVIS SERVICE STATIONS:

Alabama	Birmingham	Dreanen Motor Car Co., Ave. C and 20th St.	
Arizona	Phoenix	Motor Supply Co., 315 North Central St.	
California	Los Angeles	Edwin T. Hughes, 627 West Pico St.	
	Oakland	Berlman & Wagner, 2509 Broadway.	
	San Francisco	Consumers Battery Co., 639 Van Ness Ave.	
	San Diego	San Diego Battery & Ignition Co., 217 B St.	
Colorado	Denver	Elec. Service & Eng. Co., 1313 Broadway.	
Connecticut	Hartford	Robert R. Ashwell, 341 Trumbull St.	
	New Haven	Kirby Garage Service Station, 213 Crown St.	
	New London	Carlock & Haynes, 427 Bank St.	
Dist. of Columbia	Washington	Miller Dudley Co., 1625 Fourteenth St., N.W.	
Georgia	Atlanta	Southern Auto & Equipment Co., 92-94 So. Forsythe St.	
Illinois	Chicago	U. S. Auto Supply Co., 3845 So. Wabash Ave.	
	Springfield	A. H. Barth Elec. Co., 218 So. Fourteenth St.	
Indiana	Indianapolis	Brock & Lazer, cor. Market and Noble Sts.	
Iowa	Des Moines	Electrical Laboratories Co., 207 Ninth St.	
Kansas	Wichita	E. S. Cowie Elec. Co., 1238 East Douglas Ave.	
Louisiana	New Orleans	John M. Walton, 700 St. Charles St.	
	Shreveport	Henderson Garage, Fannin St.	
Maryland	Baltimore	Auto Elec. Co., Lafayette and Charles Sts.	
Massachusetts	Boston and Cambridge	A. R. Ferguson, 5 Carlton St., Cambridge.	
	Springfield	Krohnes Auto Garage, 57 Pearonia Ave.	
	Worcester	Jenkins & Robinson (Blue Ribbon Garage), 69 Central St.	
Michigan	Detroit	Fred E. Holmes, 1602 Woodward Ave.	
Minnesota	Minneapolis	Reinhard Bros. Co., 14 E. 8th St.	
Missouri	Kansas City	E. S. Cowie Elec. Co., 1517 Grand Ave.	
	St. Louis	Fred Campbell, 1109 Locust St.	
Nebraska	Omaha	Auto Elec. Service Co., 319 So. 19th St.	
	Lincoln	Randall & Knoll, 317 So. 11th St.	
New Jersey	Newark	P. J. Durham Co., 235 Central Ave.	
	Trenton	John L. Brock, Canal St.	
New York	Brooklyn	P. J. Durham.	
	Buffalo	McCarthy Bros. & Ford, 41 East Eagle St.	
	New York City	P. J. Durham & Co., 244 West 49th St.	
	Troy	Hendill Electric Co., 550 Fulton St.	
	Utica	E. D. & A. F. Quesh, Inc., 60 Hotel St.	
	Rochester	J. Lawrence Hill Co., 21 Plymouth Ave.	
	Syracuse	Ellis E., 403 Grape St.	
North Carolina	Raleigh	Raleigh Motor Car & Machine Co., 209 So. Salisbury St.	
North Dakota	Fargo	Howard B. Tilden.	
Ohio	Cincinnati	Boyle Engineering Co., 1042 Gilbert Ave.	
	Cleveland	C. Z. Sedgley, 1010 Chestnut Ave.	
	Columbus	Peerless Service Station, 111 East Lynn St.	
	Dayton	Herbert F. Apple, 427 East Third St.	
	Lima	O. L. DeWeese, 119 East North St.	
	Toledo	Electric Power & Maintenance Co., 1101 Monroe St.	
	Youngstown	C. Z. Sedgley, 17 N. Chestnut St.	
Oregon	Portland	Gibson Elec. Garage & Storage Battery Co., Alder St. at 12th.	
Oklahoma	Tulsa	Walsh & Johnson, 919 So. Main St.	
	Oklahoma City	Walsh & Johnson, 718 No. Broadway, 17 No. Chestnut St.	
Pennsylvania	Altoona	Spence & Finn, 1332 Twelfth Ave.	
	Philadelphia	J. H. McCullough & Son, 219 No. Broad St.	
	Pittsburgh	Penn Storage Battery Co., 5986 Center Ave.	
Rhode Island	Providence	Adelaide Garage, 535 Broad St.	
South Carolina	Columbia	Storage Battery & Electric Co., 1216 Hampton Ave.	
Texas	Dallas	McClendon & Hardy, 2612 Main St.	
	El Paso	Western Battery & Magneto Co., 508 No. Kansas St.	
	Houston	Hurlburt Still Electrical Co.	
	San Antonio	S. X. Callahan, 419 No. Flores St.	
Tennessee	Chattanooga	Ernest Holmes Co., 318 Market St.	
Utah	Salt Lake City	Inter-Mountain Elec. Co., 43 East 4th St. So.	
Virginia	Norfolk	Reliance Electric Co., 711 Granby St.	
	Richmond	Electric Service Co., 721 W. Broad St.	
Washington	Seattle	Sunset Electric Co., 606 East Pike St.	
	Spokane	Auto Ignition & Speedometer Co., 221-223 So. Monroe St.	
	Tacoma	The Automobile Supply Co.	
Wisconsin	Green Bay	Louis Broes, 218 No. Adams St.	
	Milwaukee	Lemke Electric Co., 506 Cedar St.	
Canada	Montreal	Informational Electric Co., 97 Bleury St.	
	Quebec, Que.	Louis Levesie, 134 Queen St.	
	Vancouver, B. C.	R. Hoffmeister, 1271 Granville St.	

GRAY & DAVIS, Inc., Boston, Mass.

STARTERS, Electric Engine, for Fords

A. B. C. Starter Co., 33 Woodbridge St., E., Detroit, Mich.

American Ever Ready Works, Thomson Ave. & Orton St., Long Island City, N. Y. "Eveready."

Berns—See Detroit Electric Welder Co.

Dayton Electrical Mfg. Co., U. S. Bldg., Dayton, O.

Detroit Electric Welder Co., Lansing, Mich. "Berns."

Disco Electric Mfg. Co., 500 Howard St., Detroit, Mich.

Dyneto Electric Co., Syracuse, N. Y.

Eveready—See American Ever Ready Works.

Fisher Electrical Works, 1 Lynn St., Detroit, Mich. (See page 269.)

Genemotor—See Picard & Co.

Gray & Davis, Boston, Mass. (See page 651.)

Heinze Co., John O., Springfield, O. (See page 653.)

Hendricks Magneto & Electric Co., 1200 St. Paul St., Indianapolis, Ind.

Kemco Electric Mfg. Co., Salem, O.

Pellet Magneto Co., 25th St. & Wabash Ave., Chicago, Ill. (See page 263.)

Picard & Co., A. J., 9 W. 61st St., New York, N. Y. "Genemotor." (See page 273.)

Westinghouse Electric & Mfg. Co., 110-14 W. 42d St., New York, N. Y. (See page 667.)

STARTERS, Gasoline or Vapor Engine

(For Priming Devices—See Primers, Gasoline Engine)

Automatic Starter Co., 418 N. Third St., St. Louis, Mo.

Brown-Maddock Co., West Newbury, Mass.

Markham Co., W. D., Clarksdale, Miss.

STARTERS, LEVER ENGINE—See Starters, Manual

STARTERS, Manual, Pedal or Lever Engine

(See also Cranks, Safety Starting)

Pres-Toe—See Robertson Machine & Foundry Co.

Robertson Machine & Foundry Co., W., Buffalo, N. Y. "Pres-Toe."

STARTERS, Manual, Pedal or Lever Engine, for Fords

Acme—See Industrial Mfg. Co.

Auto Parts Mfg. Co., 217 W. Seventh St., Sioux City, Ia. "Moore."

B.-B.—See Detroit Radiator & Specialty Co.

Ballard, Henry, Patterson, N. Y.

Barrett Motor Starter Mfg. Co., 1777 Broadway, New York, N. Y.

Bear Mfg. Co., E. 17th St. & First Ave., Rock Island, Ill. "Sandbo."

Brinnon—See Peters Sales Co.

Detroit Radiator & Specialty Co., 965 Woodward Ave., Detroit, Mich. "B.-B."

Equi Light Co., 121 N. Fourth St., Paducah, Ky.

Eureka Parts Co., 328 Central Ave., Dunkirk, N. Y.

Handee—See Racine Handy Mfg. Co.

Industrial Mfg. Co., 101-03 S. Fifth Ave., Chicago, Ill. "Acme," "O. K."

Knapp Bros., Starter & Equipment Co., 2357 Central Ave., Minneapolis, Minn.

Little Giant Starter Co., Cleveland Ave., Canton, O.

Majestic Mfg. & Specialty Co., 1355 S. Michigan Ave., Chicago, Ill.

Miller Mer. Co., Memphis, Mo.

Moore—See Auto Parts Mfg. Co.

Murphy Starter Co., Ida Grove, Ia.

O. K.—See Industrial Mfg. Co.

Peoria—See United Co.

Peters Sales Co., 77 S. Gift St., Columbus, O. "Brinnon."

Pres-Toe—See Robertson Machine & Foundry Co.

Quality Appliance Mfg. Co., 325 S. Western Ave., Chicago, Ill. "3-Power."

Racine Handy Mfg. Co., 107 Fifth St., Racine, Wis. "Handee."

Robertson, Machine & Foundry Co., 58 Rano St., Buffalo, N. Y. "Pres-toe."

Sandbo—See Bear Mfg. Co.

Sieverkropp Engine Co., 1402 19th St., Racine, Wis. (See page 653.)

Simplex Mfg. Co., Jackson St. & C. I. Ry., Anderson, Ind.

Star Specialty Mfg. Co., 227-33 W. Erie St., Chicago, Ill.

3-Power—See Quality Appliance Mfg. Co.

United Co., 2501 S. Washington St., Peoria, Ill. "Peoria."

Warnerite Co., 518 Harrison St., Davenport, Ia.

STARTERS, Mechanical or Spring Engine

American Ever Ready Works, Thomson Ave. & Orton St., Long Island City, N. Y. "Eveready."

Elder Mfg. Co., 2305 N. Illinois St., Indianapolis, Ind.

Eveready—See American Ever Ready Works.

M. M. & E. Sales Co., Lenawee Co. Bank Bldg., Adrian, Mich. "Peerless."

Peerless—See M. M. & E. Sales Co.

Rockway—See Rowell Co.

Rowell Co., I. B., Lincoln Ave., Waukesha, Wis. "Rockway."

STARTERS, Mechanical or Spring Engine, for Fords

American Ever Ready Works, Thomson Ave. & Orton St., Long Island City, N. Y. "Eveready."

Eveready—See American Ever Ready Works.

Neher, L. M., Warsaw, Ind.

STARTERS, Motor Boat Compressed Air Engine

Christensen Engineering Co., First National Bank Bldg., Milwaukee, Wis.

STARTERS, Motor Boat Electric Engine

North East Electric Co., Rochester, N. Y. (See pages 265 to 268.)

Simms Magneto Co., 277 N. Arlington Ave., East Orange, N. J.

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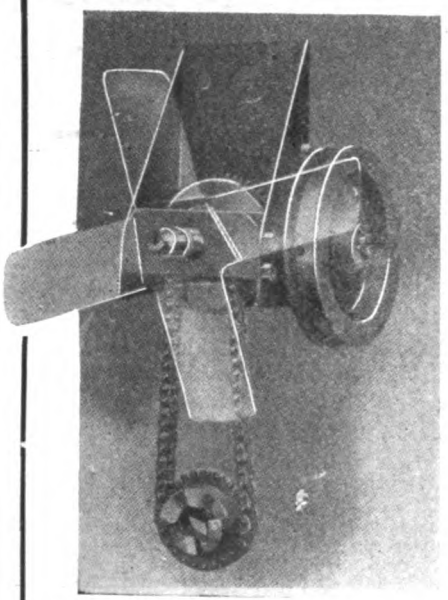

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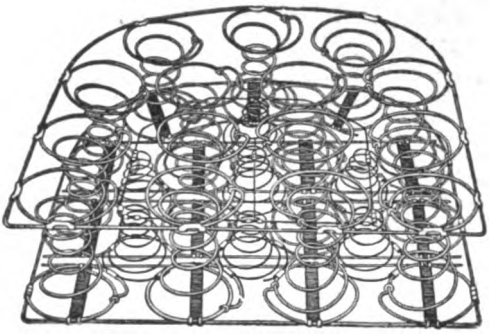

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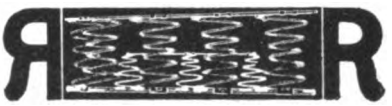

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No Possible Bumps or Jars — See these Auxiliary Springs?

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NOTHING SO COMFORTABLE
No Shocks or Jars when Rough Riders are used
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Keep up sales totals by pushing Heinze-Springfield equipment.
Write or wire for proposition
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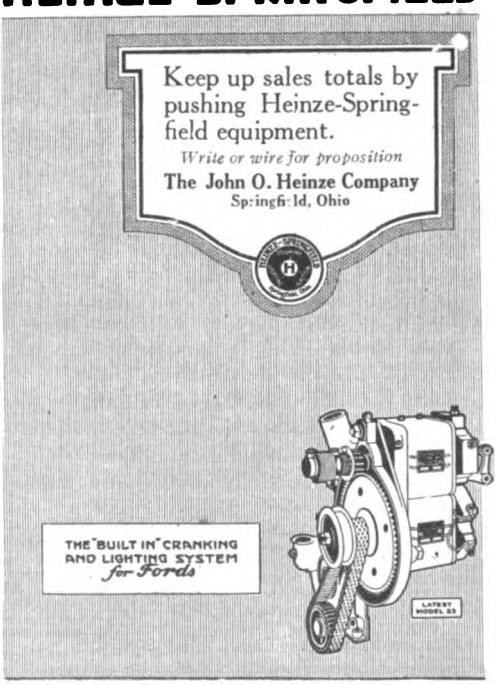

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STARTERS, Motor Boat Rear Engine

Gardner—See Lakeland Motor Works.
Joe's—See Snow & Petrelli Mfg. Co.
Lakeland Motor Works, Lakeland, Mich. "Gardner."
Snow & Petrelli Mfg. Co., 152 Brewery St., New Haven, Conn. "Joe's."

STARTERS, PEDAL ENGINE—See Starters, Manual

STARTERS, SPRING ENGINE—See Starters, Mechanical

STARTERS, Tractor Compressed Air

Christensen Eng. Co., First National Bank Bldg., Milwaukee, Wis.

STARTERS, Tractor Electric

North East Electric Co., Rochester, N. Y. (See pages 265 to 268.)
Remy Electric Co., 1623 E. Grand Blvd., Detroit, Mich.
Simms Magneto Co., 277 N. Arlington Ave., East Orange, N. J.

STARTERS, VAPOR ENGINE—See Starters, Gasoline

STARTING CRANK HANDLES—See Handles, Starting Crank

STARTING CRANK HOLDERS—See Holders, Starting Crank

STARTING CRANK LOCKS—See Locks, Starting Crank

STARTING CRANKS, SAFETY — See Cranks, Safety

STATIONS, Electric Service

(Covering only electric service stations who advertise in this publication)

Jones Electric Co., Arthur, 2837 S. State St., Chicago, Ill. (See page 447.)
Motor Car Service Co., 524-28 E. 35th St., Chicago, Ill. (See page 691.)
Pellet Magneto Co., 25th St. & Wabash Ave., Chicago, Ill. (See page 263.)

STATOSCOPES, Aircraft

Custer Specialty Co., 26-28 N. Ludlow St., Dayton, O.

STEADIERS, STEERING GEAR — See Checks, Steering Gear

STEADY BEARINGS—See Bearings, Drive Shaft Steady

STEAM BOILERS—See Boilers, Steam

STEAM GAGES—See Gages, Steam

STEAM HAMMERS—See Hammers, Steam

STEAM PUMPS—See Pumps, Steam

STEAM TIRE CURING BAGS—See Bags, Steam Tire Curing

STEAMERS, Storage Battery

(Apparatus for softening the sealing compound on storage batteries by means of steam)

American Bureau of Engineering, 1018 S. Wabash Ave., Chicago, Ill. "Peers." (See page 855.)
Peers—See American Bureau of Engineering.

STEEL or Iron, Angle, Channel and Tee

Bethlehem Steel Co., Third & Poplar Sts., South Bethlehem, Pa.
Cambria Steel Co., Johnstown, Pa.
Carnegie Steel Co., Carnegie Bldg., Pittsburgh, Pa.
Dunkle Co., Arthur J., 50 Church St., New York, N. Y. (Dealers.) (See page 671.)
Illinois Steel Co., 208 S. La Salle St., Chicago, Ill.
Inland Steel Co., First National Bank Bldg., Chicago, Ill.
Jones & Laughlin Steel Co., Pittsburgh, Pa.
Lockhart Iron & Steel Co., McKees Rocks, Pa. "Vulcan."
Logan Iron & Steel Co., 1421 Chestnut St., Philadelphia, Pa.
Republic Iron & Steel Co., Republic Bldg., Youngstown, O.
Vulcan—See Lockhart Iron & Steel Co.

STEEL BALLS—See Balls, Steel

STEEL or Iron, Bar

American Iron & Steel Mfg. Co., Front & Cumberland Sts., Lebanon, Pa.
Bethlehem Steel Co., Third & Poplar Sts., South Bethlehem, Pa.
Cambria Steel Co., Johnstown, Pa.
Carnegie Steel Co., Carnegie Bldg., Pittsburgh, Pa.
Dunkle Co., Arthur J., 50 Church St., New York, N. Y. (Dealers.) (See page 671.)
Illingsworth Steel Co., John (Frankford), Philadelphia, Pa.
Illinois Steel Co., 208 S. La Salle St., Chicago, Ill.
Inland Steel Co., First National Bank Bldg., Chicago, Ill.
Jones & Laughlin Steel Co., Pittsburgh, Pa.
Lackawanna Steel Co., Buffalo, N. Y.
Lockhart Iron & Steel Co., McKees Rocks, Pa. "Vulcan."
Logan Iron & Steel Co., 1421 Chestnut St., Philadelphia, Pa.
Pardee Works, C., Perth Amboy, N. J.
Philadelphia Steel & Forge Co., 50 Church St., New York, N. Y.
Railway Steel Spring Co., 30 Church St., New York, N. Y.
Republic Iron & Steel Co., Republic Bldg., Youngstown, O.
United Alloy Steel Co., Canton, O.
Vulcan—See Lockhart Iron & Steel Co.

STEEL CASTINGS—See Castings, Steel

STEEL, CHANNEL—See Steel, Angle

STEEL, Chrome Nickel

Agathon—See Central Steel Co.
American Import & Export Co., 150 Nassau St., New York, N. Y. (Importers.)
Arbo—See Carbon Steel Co.
Arrow—See Crowley Co.
Becker Steel Co. of America, 154 Nassau St., New York, N. Y. (Importers.)
Bethlehem Steel Co., Third & Poplar Sts., South Bethlehem, Pa.
Carbon Steel Co., ft. 32d St., Pittsburgh, Pa. "Arbo," "Decco," "Shrapo."
Carnegie Steel Co., Carnegie Bldg., Pittsburgh, Pa.
Carpenter Steel Co., Reading, Pa.
Central Steel Co., Massillon, O. "Agathon."

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for Trucks, Trailers, and Tractors

Being pioneers and specialists in the production of truck, trailer and tractor springs has given us a lead in this line of work.

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IRON CITY SPRING CO.

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SILENT SMOKELESS POWER

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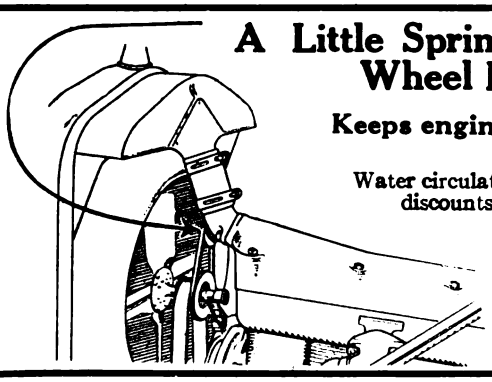
1.25 up to 4¾"
1.50 up to 5½"



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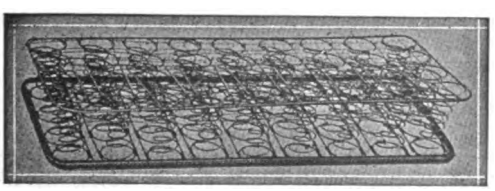

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STEEL, Chrome Nickel (Continued)

Crowley Co., John A., 120-22 Liberty St., New York, N. Y. "Arrow."
Crucible Steel Co. of America, Oliver Bldg., Pittsburgh, Pa. "Simplex," "Duplex."
Decco—See Carbon Steel Co.
Duplex—See Crucible Steel Co. of America.
Fairley-Davidson Steel Co., 124 Maiden Lane, New York, N. Y. (Importers.) "Hehtemnd."
Frasse & Co., Peter A., 417 Canal St., New York, N. Y. (see page 657.)
Fulton Steel Corp., 149 Broadway, New York, N. Y. "Great Bear." (See page 657.)
Great Bear—See Fulton Steel Corp.
Halcomb Steel Co., Syracuse, N. Y.
Hehtemnd—See Fairley-Davidson Steel Co.
Heller Bros. Co., Newark, N. J.
Illingsworth Steel Co., John (Frankford), Philadelphia, Pa.
Illinois Steel Co., 203 S. La Salle St., Chicago, Ill.
Interstate Iron & Steel Co., 104 S. Michigan Ave., Chicago, Ill.
La Salle Steel Co., 2305 S. Halsted St., Chicago, Ill.
Lindenberg Steel Co., 90 West St., New York, N. Y. (Importers.)
McInnes Steel Co., Corey, Pa.
Midvale Steel Co., Widener Bldg. (Nicetown), Philadelphia, Pa.
National Lock Washer Co., 65 Johnson St., Newark, N. J.
Philadelphia Steel & Forge Co., 50 Church St., New York, N. Y.
Roechling Electro Steel Co., 173-77 Lafayette St., New York, N. Y. (Importers.)
Shrapo—See Carbon Steel Co.
Simplex—See Crucible Steel Co. of America.
Union Drawn Steel Co., Beaver Falls, Pa. (See page 657.)
United Alloy Steel Co., Canton, O. "Tusco."
Vulcan Crucible Steel Co., First St., Aliquippa, Pa.

STEEL CLUTCH DISCS—See Discs, Steel

STEEL, Cold Rolled Bar

Cambria Steel Co., Johnstown, Pa.
Columbia Steel & Shafting Co., Pittsburgh, Pa.
Compressed Steel Shafting Co., 393 Dorchester Ave., Boston, Mass.
Crucible Steel Co. of America, Oliver Bldg., Pittsburgh, Pa.
Cumberland Steel Co., William St. & B. & O. R. R., Cumberland, Md. (See page 731.)
Dunkle Co., Arthur J., 50 Church St., New York, N. Y. (Dealers.) (See page 671.)
Jones & Laughlin Steel Co., Pittsburgh, Pa.
Lancaster Steel Products Co., Manheim Pike, Lancaster, Pa.
Moltrup Steel Products Co., Beaver Falls, Pa.
National Drawn Steel Co., East Liverpool, O.
Pardee Works, C., Perth Amboy, N. J.
Peerless Drawn Steel Co., Massillon, O.
Pittsburgh Shafting Co. of Detroit, Detroit, Mich.
Union Drawn Steel Co., Beaver Falls, Pa. (See page 657.)
United Alloy Steel Co., Canton, O.

STEEL, Cold Rolled Strip

American Steel & Wire Co., Chicago, Ill. (See page 203.)
American Tube & Stamping Co., 471 Hancock Ave., Bridgeport, Conn.
Carpenter Steel Co., Reading, Pa.
Columbia Steel Co., Elyria, O.
Crucible Steel Co. of America, Oliver Bldg., Pittsburgh, Pa.
Dunkle Co., Arthur J., 50 Church St., New York, N. Y. (Dealers.) (See page 671.)
La Salle Steel Co., 2305 S. Halsted St., Chicago, Ill.
Moltrup Steel Products Co., Beaver Falls, Pa.
Morris & Bailey Steel Co., Pittsburgh, Pa.
National Pressed Steel Co., Massillon, O.
Peerless Drawn Steel Co., Massillon, O.
Pittsburgh Shafting Co. of Detroit, Detroit, Mich.
Stanley Works, New Britain, Conn. (See page 347.)
Superior Steel Co., Carnegie, Pa.
West Leechburg Steel Co., 305 Fifth Ave., Pittsburgh, Pa.
Worcester Pressed Steel Co., Worcester, Mass.

STEEL, Dealers in

(Comprising only Dealers in Iron, Steel and other metals who advertise in this publication)

Dunkle Co., Arthur J., 50 Church St., New York, N. Y. (See page 671.)
Morris & Co., E. K., 311-17 W. Second St., Cincinnati, O. (See page 727.)
Reliance Steel & Tool Co., 24-26 Murray St., New York, N. Y. (See page 275.)

STEEL FAN PULLEYS — See Pulleys, Pressed Steel Fan

STEEL, High-Speed Cutting

Albion—See Hobson, Houghton & Co.
Allen & Co., Edgar, 713 W. Lake St., Chicago, Ill. (Importers.)
Andrew & Co., J. H., 26 Cortlandt St., New York, N. Y. (Importers.) "Toledo."
Ark—See Jessop & Sons.
Arrow—See Crowley Co.
Atlas Crucible Steel Co., 66 Howard Ave., Dunkirk, N. Y. "L-xx."
Becker Steel Co. of America, 154 Nassau St., New York, N. Y. (Importers.)
Bohlers—See Houghton & Richards.
Burgess—See Cyclops Steel Co.
Carpenter Steel Co., Reading Pa. "Star Zenith."
Clarite—See Columbia Tool Steel Co.
Colonial Steel Co., Keystone Bldg., Pittsburgh, Pa.
Columbia Tool Steel Co., Chicago Heights, Ill. "Clarite."
Crowley Co., John A., 120-22 Liberty St., New York, N. Y. "Arrow."
Crucible Steel Co. of America, Oliver Bldg., Pittsburgh, Pa. "Rex."
Cyclops Steel Co., 265 E. Spring St., Titusville, Pa. "Burgess."
Dreadnought—See Halcomb Steel Co.
Dunkle Co., Arthur J., 50 Church St., New York, N. Y. (Dealers.) (See page 671.)
Fairley-Davidson Steel Co., 124 Maiden Lane, New York, N. Y. (Importers.) "X-tof," "Rushitoff."
Fearless—See Hobson, Houghton & Co.
Frasse & Co., Peter A., 417 Canal St., New York, N. Y. (See page 657.)
Fulton Steel Corp., 149 Broadway, New York, N. Y. "Great Bear." (See page 657.)
Great Bear—See Fulton Steel Corp.
Halcomb Steel Co., Syracuse, N. Y. "Dreadnought."

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Write us today and we will tell you more about this "new steel"—how it increases production—saves labor at the machines—decreases investment in cutting-tool equipment and saves labor in regrinding.

We are doing it for others—and can do it for you.

We also supply electric — carbon — tool and alloy steels.

FULTON STEEL CORPORATION

Plant at Fulton, N. Y. Send Inquiries to 149 Broadway, N. Y. C.

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WORKS: BEAVER FALLS, PA. and GARY, IND.

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- **Alloy Steels** (Heat Treated or Not) { Nickel—1% and 3½% Nickel Chromium Chromium Chromium—Vanadium, etc.
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- **Piston Rods**
- **Special Shapes**
- **Special Case-Hardening Steels**

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Because the traffic of the world is regulated by red and green signals.

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STEEL, High-Speed Cutting (Continued)

Heller Bros. Co., Newark, N. J.
Hobson, Houghton & Co., 38 Beekman St., New York, N. Y. (Importers.) "Albion," "Fearless."
Houghton & Richards, 145 Oliver St., Boston, Mass. "Bohlers."
Improved Capital—See Ward's Sons Co.
Jessop & Sons, Wm., 91 John St., New York, N. Y. (Importers.) "Ark."
L-XX—See Atlas Crucible Steel Co.
Lindenberg Steel Co., 90 West St., New York, N. Y. (Importers.)
Ludlum Steel Co., Watervliet, N. Y. "Mohawk," "Seneca."
McInnes Steel Co., Corry, Pa.
Midvale Steel Co., Widener Bldg. (Nicetown), Philadelphia, Pa.
Mohawk—See Ludlum Steel Co.
Red Cut Superior—See Vanadium-Alloys Steel Co.
Reliance Steel & Tool Co., 24-26 Murray St., New York, N. Y. (Dealers.) (See page 275.)
Rex—See Crucible Steel Co. of America.
Roechling Electro Steel Co., 173-77 Lafayette St., New York, N. Y. (Importers.)
Rushitoff—See Fairley-Davidson Steel Co.
Seneca—See Ludlum Steel Co.
Star Zenith—See Carpenter Steel Co.
Toledo—See Andrew & Co.
Vanadium-Alloys Steel Co., Pittsburgh, Pa. "Red Cut Superior."
Vulcan Crucible Steel Co., First St., Aliquippa, Pa.
Tusco—See United Alloy Steel Co.
Ward's Sons Co., Edgar T., 44 Farnsworth St., Boston, Mass. (Importers.) "Improved Capital." (See page 727.)
X-Tof—See Fairley-Davidson Steel Co.

STEEL LETTERS—See Stamps, Steel

STEEL, Manganese

Fulton Steel Corp., 149 Broadway, New York, N. Y. "Great Bear." (See page 657.)
Great Bear—See Fulton Steel Corp.
National Lock Washer Co., 65 Johnson St., Newark, N. J.
United Alloy Steel Co., Canton, O.

STEEL MATS—See Mats, Floor Board

STEEL MOLDING—See Molding, Steel

STEEL, Nickel

Agathon—See Central Steel Co.
Allen & Co., Edgar, 718 W. Lake St., Chicago, Ill. (Importers.)
Arrow—See Crowley Co.
Becker Steel Co. of America, 154 Nassau St., New York, N. Y. (Importers.)
Carbon Steel Co., ft. 32d St., Pittsburgh, Pa. "Nico."
Carnegie Steel Co., Carnegie Bldg., Pittsburgh, Pa.
Carpenter Steel Co., Reading, Pa.
Central Steel Co., Massillon, O. "Agathon."
Colonial Steel Co., Keystone Bldg., Pittsburgh, Pa.
Crowley Co., John A., 120-22 Liberty St., New York, N. Y. "Arrow."
Crucible Steel Co. of America, Oliver Bldg., Pittsburgh, Pa.
Fairley-Davidson Steel Co., 124 Maiden Lane, New York, N. Y. (Importers.) "Hehtemnd."
Frasse & Co., Peter A., 417 Canal St., New York, N. Y. (See page 657.)
Halcomb Steel Co., Syracuse, N. Y.
Hehtemnd—See Fairley-Davidson Steel Co.
Helmuth Co., L., 17 Battery Pl., New York, N. Y. (Importers.)
Illinois Steel Co., 203 S. La Salle St., Chicago, Ill.
La Salle Steel Co., 2305 S. Halsted St., Chicago, Ill.
Lindenberg Steel Co., 90 West St., New York, N. Y. (Importers.)
Midvale Steel Co., Widener Bldg. (Nicetown), Philadelphia, Pa.
National Lock Washer Co., 65 Johnson St., Newark, N. J.
Nico—See Carbon Steel Co.
Philadelphia Steel & Forge Co., 50 Church St., New York, N. Y.
Pittsburgh Shafting Co. of Detroit, Detroit, Mich.
Pittsburgh Tool Steel Wire Co., Monaca, Pa.
Union Drawn Steel Co., Beaver Falls, Pa. (See page 657.)
United Alloy Steel Co., Canton, O.
Vulcan Crucible Steel Co., First St., Aliquippa, Pa.

STEEL NUMBERS—See Stamps, Steel

STEEL RULES—See Rules, Steel

STEEL, Self-Hardening Cutting

Allen & Co., Edgar, 718 W. Lake St., Chicago, Ill. (Importers.)
Blue Clip—See Firth-Sterling Steel Co.
Firth-Sterling Steel Co., McKeesport, Pa. "Blue Clip."
Halcomb Steel Co., Syracuse, N. Y.
Hobson, Houghton & Co., 33 Beekman St., New York, N. Y. (Importers.) "Soho."
Illingsworth Steel Co., John (Frankford), Philadelphia, Pa.
Jessop & Sons, Wm., 91 John St., New York, N. Y. (Importers.)
Soho—See Hobson, Houghton & Co.
Vulcan Crucible Steel Co., First St., Aliquippa, Pa. "Wolfram."
Wolfram—See Vulcan Crucible Steel Co.

STEEL, Sheet

Allegheny Steel Co., Brackenridge, Pa.
American Rolling Mill Co., Middletown, O. "Middletown."
American Sheet & Tin Plate Co., Frick Bldg., Pittsburgh, Pa.
Carnahan Tin Plate & Sheet Co., Canton, O.
Colonial Steel Co., Keystone Bldg., Pittsburgh, Pa.
Dunkle Co., Arthur J., 50 Church St., New York, N. Y. (Dealers.) (See page 671.)
Follansbee Bros. Co., Third & Liberty Aves., Pittsburgh, Pa.
Inland Steel Co., First National Bank Bldg., Chicago, Ill.
La Belle Iron Works, Steubenville, O.
La Salle Steel Co., 2305 S. Halsted St., Chicago, Ill.
McVoy Sheet & Tin Plate Co., 344-50 W. Michigan St., Chicago, Ill.
Mansfield Sheet & Tin Plate Co., Mansfield, O.
Massillon Rolling Mill Co., Massillon, O.
Middletown—See American Rolling Mill Co.
Taylor Co., N. & G., 308 Chestnut St., Philadelphia, Pa.
United States Iron & Steel Co., Woolworth Bldg., New York, N. Y. (Dealers.) (See page 799.)
Youngstown Sheet & Tube Co., Youngstown, O.

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HERE'S a stand that's steel throughout—trays, legs and drawer. Its unique construction affords ample strength with minimum weight—stability and durability without clumsiness. Height to top tray, 32 inches. Size of trays, 16" x 26".

Drawer is fitted with cylinder lock having two keys. Slide ways are welded to under side of upper tray and give to drawer a smooth movement, free from binding or cramping tendency.

These stands are indispensable for assemblers, machine operators, etc. May be had with two or three trays, and with or without drawer.

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"Shop Furniture Originators"
NEW BRITAIN, CONN., U. S. A.

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Every Motorist With a Youngster Who Sees the Rock-a-Bye Auto Seat Is a Sure Purchaser

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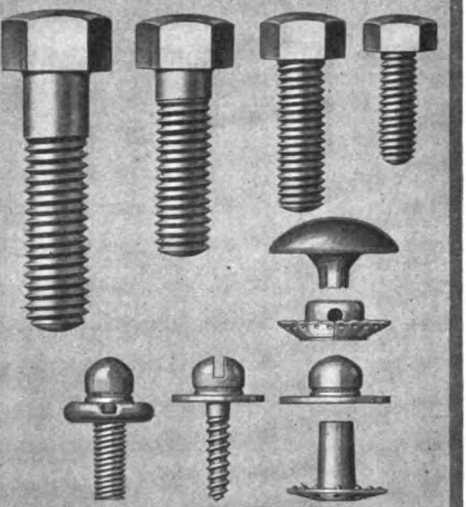

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Of every standard size; any special size will be made to order.

Snap Fasteners
For side curtains, seat covers, mats and pocket covers.

Special Parts to Order
Small stamped and formed parts and screw machine products in Brass, Bronze or Nickel Silver;

Or; Brass, Bronze and Nickel Silver in sheets and rods for your own factory to manufacture.

Scovill Mfg. Co.

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Waterbury, Conn.

Detroit New York
Chicago Boston

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STEEL, Spring

Arrow—See Crowley Co.

Bethlehem Steel Co., Third & Poplar Sts., South Bethlehem, Pa.

Cambria Steel Co., Johnstown, Pa.

Carnegie Steel Co., Carnegie Bldg., Pittsburgh, Pa.

Carpenter Steel Co., Reading, Pa. "Flexo."

Crowley Co., John A., 120-22 Liberty St., New York, N. Y. "Arrow."

Crucia—See United Alloy Steel Co.

Crucible Steel Co. of America, Oliver Bldg., Pittsburgh, Pa.

Excelsior—See Fairley-Davidson Steel Co.

Fairley-Davidson Steel Co., 124 Maiden Lane, New York, N. Y. (Importers.) "Excelsior."

Flexo—See Carpenter Steel Co.

Frasse & Co., Peter A., 417 Canal St., New York, N. Y. (See page 657.)

Halcomb Steel Co., Syracuse, N. Y.

Harrow Spring Co.—See Steel Sales Co.

Helmuth Co., L., 17 Battery Pl., New York, N. Y. (Importers.)

Illinois Steel Co., 203 S. La Salle St., Chicago, Ill.

Midvale Steel Co., Widener Bldg. (Nicetown), Philadelphia, Pa.

National Lock Washer Co., 65 Johnson St., Newark, N. J.

Philadelphia Steel & Forge Co., 50 Church St., New York, N. Y.

Steel Sales Co., Jefferson & Adams Sts., Chicago, Ill. (Sole Distributors for Harrow Spring Co., Milwaukee, Wis.)

United Alloy Steel Co., Canton, O. "Crucia."

Universal Rolling Mill Co., Bridgeville, Pa.

Vulcan Crucible Steel Co., First St., Aliquippa, Pa.

STEEL STAMPINGS—See Stampings and Pressings, Metal

STEEL, TEE—See Steel, Angle

STEEL TESTING INSTRUMENTS—See Instruments, Metal Testing

STEEL, Tool

Allen & Co., Edgar, 713 W. Lake St., Chicago, Ill. (Importers.)

Andrew & Co., J. H., 26 Cortlandt St., New York, N. Y. (Importers.) "Toledo."

Arrow—See Crowley Co.

Atlas Crucible Steel Co., 66 Howard Ave., Dunkirk, N. Y. "Deward."

Becker Steel Co. of America, 154 Nassau St., New York, N. Y. (Importers.)

Black Diamond—See Crucible Steel Co. of America.

Bohlers—See Houghton & Richards.

Bourne-Fuller Co., Hickox Bldg., Cleveland, O.

Brown & Co., Tenth St. & Duquesne Way, Pittsburgh, Pa.

Carbon Steel Co., ft. 32d St., Pittsburgh, Pa. "Weto," "Cromo."

Carnegie Steel Co., Carnegie Bldg., Pittsburgh, Pa.

Carpenter Steel Co., Reading Pa. "Comet," "K-W.," "Stentor."

Colonial Steel Co., Keystone Bldg., Pittsburgh, Pa. "Red Star."

Columbia Tool Steel Co., Chicago Heights, Ill.

Comet—See Carpenter Steel Co.

Crescent—See Crucible Steel Co. of America.

Cromo—See Carbon Steel Co.

Crowley Co., John A., 120-22 Liberty St., New York, N. Y. "Arrow."

Crucible Steel Co. of America, Oliver Bldg., Pittsburgh, Pa. "Black Diamond," "Crescent," "Sanderson."

Cyclops Steel Co., 265 E. Spring St., Titusville, Pa.

Dannemora—See Nash Co.

Deward—See Atlas Crucible Steel Co.

Dunkle Co., Arthur J., 50 Church St., New York, N. Y. (Dealers.) (See page 671.)

Fairley-Davidson Steel Co., 124 Maiden Lane, New York, N. Y. (Importers.) "Fondwot."

Firth-Sterling Steel Co., McKeesport, Pa.

Fondwot—See Fairley-Davidson Steel Co.

Frasse & Co., Peter A., 417 Canal St., New York, N. Y. (See page 657.)

Halcomb Steel Co., Syracuse, N. Y.

Heller Bros. Co., Newark, N. J.

Hobson, Houghton & Co., 83 Beekman St., New York, N. Y. (Importers.)

Houghton & Richards, 145 Oliver St., Boston, Mass. "Bohlers."

Illingsworth Steel Co., John (Frankford), Philadelphia, Pa.

Jessop & Sons, Wm., 91 John St., New York, N. Y. (Importers.)

K-W—See Carpenter Steel Co.

Lancaster Steel Products Co., Manheim Pike, Lancaster, Pa.

Lindenberg Steel Co., 90 West St., New York, N. Y. (Importers.)

Ludlum Steel Co., Watervliet, N. Y. "Pompton."

McInnes Steel Co., Corry, Pa.

Midvale Steel Co., Widener Bldg. (Nicetown), Philadelphia, Pa.

Philadelphia Steel & Forge Co., 50 Church St., New York, N. Y.

Pittsburgh Tool Steel Wire Co., Monaca, Pa.

Pompton—See Ludlum Steel Co.

Red Star—See Colonial Steel Co.

Reliance Steel & Tool Co., 24-26 Murray St., New York, N. Y. (Dealers.) (See page 275.)

Roechling Electro Steel Co., 173-77 Lafayette St., New York, N. Y. (Importers.)

Sanderson—See Crucible Steel Co. of America.

Stentor—See Carpenter Steel Co.

Toledo—See Andrew & Co.

Universal Rolling Mill Co., Bridgeville, Pa.

Vanadium-Alloys Steel Co., Pittsburgh, Pa. "Vasco."

Vasco—See Vanadium-Alloys Steel Co.

Vulcan Crucible Steel Co., First St., Aliquippa, Pa.

Ward's Sons Co., Edgar T., 44 Farnsworth St., Boston, Mass. (Importers.) "Dannemora." (See page 727.)

Weto—See Carbon Steel Co.

STEEL TUBE—See Tubing, Steel

STEEL, Vanadium

Agathon—See Central Steel Co.

Allen & Co., Edgar, 713 W. Lake St., Chicago, Ill. (Importers.)

Alva—See Crucible Steel Co. of America.

Carnegie Steel Co., Carnegie Bldg., Pittsburgh, Pa.

Central Steel Co., Massillon, O. "Agathon."

Crucible Steel Co. of America, Oliver Bldg., Pittsburgh, Pa. "Alva."

Fairley-Davidson Steel Co., 124 Maiden Lane, New York, N. Y. (Importers.) "Hehtemnd."

Fulton Steel Corp., 149 Broadway, New York, N. Y. "Great Bear." (See page 657.)

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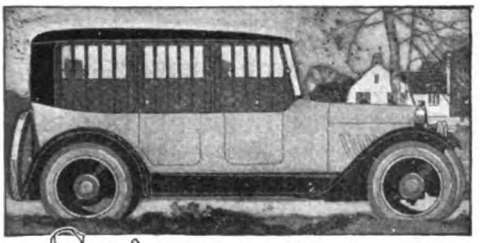
JANUARY · FEBRUARY · MARCH · APRIL · MAY · JUNE



Spring RAIN PROTECTION
JIFFY CURTAINS IN PLACE

Summer COMPLETE VENTILATION
ALL PANELS REMOVED

MEETING TODAY'S CAR DEMAND

As a motor car dealer you realize that the times intensify the need for all-year cars that are all-purpose cars.

You know that people at large now want to invest only in automobiles which are most useful and at the same time most economical.

The prime advantage of the Rex All-Seasons Top, as applied to a standard model, is that it gives that model a very strong appeal to the day's demand.

It creates a closed car several hundred pounds lighter than the conventional unit-body sedan or coupé — and, therefore, more active in performance and more economical in the use of gasoline, oil and tires.

Thus it splendidly serves the motor car dealer's interest by enabling him to offer for sale exactly the type of automobile that many families and individuals want to buy.

Notify your manufacturer that you desire to display sedans and coupés equipped with the Rex All-Seasons Top.

Physicians and salesmen find that roadsters sheltered with the Rex All-Seasons Top afford the most desirable combination of service and savings on constant duty.

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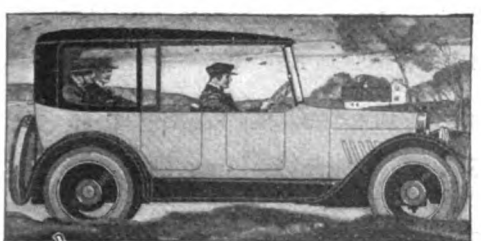
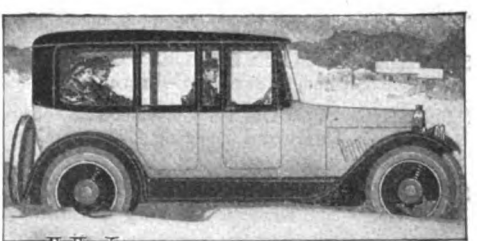
Connersville, Indiana
Direct Factory Representatives: The American Distributing Co., Kresge Bldg., Detroit, Mich.



Autumn TONNEAU PROTECTION
REAR PANELS IN PLACE



Winter WEATHER TIGHT
ALL PANELS IN PLACE

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UNDER PATENTS THAT ARE BASIC

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STEEL, Vanadium (Continued)

Great Bear—See Fulton Steel Corp.
Halcomb Steel Co., Syracuse, N. Y.
Harrow Spring Co.—See Steel Sales Co.
Hehtemnd—See Fairley-Davidson Steel Co.
Interstate Iron & Steel Co., 104 S. Michigan Ave., Chicago, Ill.
La Salle Steel Co., 2305 S. Halsted St., Chicago, Ill.
Ludlum Steel Co., Watervliet, N. Y.
McInnes Steel Co., Corry, Pa.
Midvale Steel Co., Widener Bldg. (Nicetown), Philadelphia, Pa.
National Lock Washer Co., 65 Johnson St., Newark, N. J.
Pittsburgh Tool Steel Wire Co., Monaca, Pa.
Steel Sales Co., Jefferson & Adams Sts., Chicago, Ill. (Sole Distributors for Harrow Spring Co., Milwaukee, Wis.)
Union Drawn Steel Co., Beaver Falls, Pa. (See page 657.)
United Alloy Steel Co., Canton, O.
Vanadium-Alloys Steel Co., Pittsburgh, Pa. "Vasco."
Vasco—See Vanadium-Alloys Steel Co.
Vulcan Crucible Steel Co., First St., Aliquippa, Pa.

STEEL WASHERS—See Washers, Iron

STEEL WHEEL RIMS, AEROPLANE—See Rims, Aeroplane Wheel

STEEL WHEEL RIMS, MOTORCYCLE—See Rims, Motorcycle Steel Wheel

STEEL WHEELS—See Wheels, Cast Steel; also Wheels, Pressed and Wrought Steel

STEEL WIRE—See Wire

STEEL WIRE BROOMS—See Brooms, Steel Wire

STEEL WOOL—See Wool, Steel

STEERING APPARATUS — See Gears, Steering

STEERING COLUMN BRACES FOR FORDS—See Braces, Steering Column

STEERING COLUMN CONTROLS—See Controls, Dash and Steering Column Carburetor

STEERING COLUMN SILENCERS FOR FORDS—See Braces, Steering Column

STEERING CONNECTIONS—See Connections, Steering

STEERING CONNECTIONS FOR FORDS—See Links, Steering

STEERING DEVICES—See Checks, Steering Gear

STEERING GEAR CHECKS—See Checks, Steering Gear

STEERING GEAR LOCKS FOR FORDS—See Locks, Steering Gear

STEERING GEAR STEADYING DEVICES—See Checks, Steering Gear

STEERING GEAR STRUTS—See Checks, Steering Gear

STEERING GEARS—See Gears, Steering

STEERING KNUCKLE BOOTS—See Boots, Steering Knuckle

STEERING KNUCKLES — See Forgings, Drop

STEERING LINKS FOR FORDS—See Links, Steering

STEERING RINGS, QUICK DETACHABLE TRACTOR—See Rings, Tractor Quick Detachable Steering

STEERING ROD SILENCERS FOR FORDS—See Anti-Rattlers, Steering Rod

STEERING RODS FOR FORDS — See Links, Steering

STEERING WHEEL CLOCKS FOR FORDS—See Clocks, Steering Wheel

STEERING WHEEL COVERS—See Covers, Steering Wheel

STEERING WHEEL RIMS—See Rims, Wood Steering Wheel; also Rims, Rubber Steering Wheel

STEERING WHEEL SWITCHES — See Switches, Steering Wheel

STEERING WHEELS—See Wheels, Steering

STEERING WHEELS, ELECTRICALLY HEATED—See Wheels, Heated Steering

STEM ADJUSTERS—See Adjusters, Valve Stem

STEP BOLTS—See Bolts, Machine and Carriage

STEP HANGERS—See Hangers, Pressed Steel Step

STEP MATS—See Mats, Running Board

STEP PLATES—See Plates, Heel, Pedal or Step

STEPS, DISAPPEARING—See Steps, Special Folding

STEPS, FORGED—See Forgings, Drop

STEPS, Special Folding

Weiss Co., 329 W. Market St., Indianapolis, Ind.

STEPS AND RUNNING BOARDS—See Boards, Running

STERN BEARINGS, MOTOR BOAT—See Bearings, Motor Boat Stern

STETHOSCOPES, MOTOR TESTING—See Instruments, Motor Testing

STICKS, AEROPLANE—See Parts, Wood

STILLS, Water

(For distilling water for use in storage batteries)

Barnstead Still & Sterilizer Co., 51 Chardon St., Boston, Mass.
General Scientific Equipment Co., Drexel Bldg., Philadelphia, Pa. "Peerless."
Lalor, W. M., 431 S. Dearborn St., Chicago, Ill.
Link Co., A. P., 223 73d St., Brooklyn, N. Y.
Peerless—See General Scientific Equipment Co.

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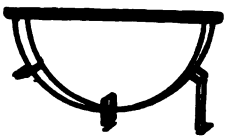

TIRE HOLDERS for rear of Fords and Chevrolets to carry extra wire or wooden wheels quite as well as tires with or without demountable rims. Also Holders to attach to running board. Basket type Holders made to manufacturer's specifications.

AUXILIARY CHAIRS for use in any car whether large or small. Make room for extra passengers without crowding. Offered in four sizes and eight finishes. Luxuriously comfortable, fold compactly. Handsomely finished. Reasonably priced.

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Liberty Siren

SINGS LIKE A MOCKING BIRD

Every motorist wants one. Easily attached to exhaust manifold—fits all cars—saves the battery. Dealers—if your jobber can't supply you, write us, mentioning jobber's name.

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Complete

A Rim Tool That Does Its Work Well.

THE LAWCO Fits 50 Rims

The Lawco Rim Tool unlatches 50 types of cross split rims. Tire is removed in one minute or less. Quickly adjustable to any size rim. Action easy, quick and sure. Made of forged steel, practically indestructible. Closes like a knife to go in tool box. Weighs 5½ pounds. Will not injure tire, rim or valve stem. A simple and workable tool which is *selling in a big way.*

Demonstrates Effectively Popularly Priced—$3.50

A Good Profit to Dealers on a Quick Selling Tool. Get our proposition. Write Now.

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Dealers Wanted

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There is good money in this line. Suppose you let us send you our terms to dealers—together with full details of our K-S Auto Heater.

With no new cars to be had for some time, a car that is now stolen cannot be replaced, even if insured. This condition means that all cars will be made as burglar proof as possible.

The K-S lock has been pronounced 100% perfect for its quality, simplicity and mechanism.

K&S

It will make any car burglar proof. You have only to tell this fact to your customers and they will buy.

Write us today for our terms to dealers.

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STITCHING MACHINES—See Machines, Double Tread Tire Stitching

STOCK RACKS—See Racks, Metal Tool

STOCKS, Die

Acme—See American Tap & Die Co.
Adamantine—See American Tap & Die Co.
American Tap & Die Co., Greenfield, Mass. "Acme," "Adamantine." (See page 685.)
Armstrong Mfg. Co., 335 Knowlton Ave., Bridgeport, Conn.
Bay State Tap & Die Co., Mansfield, Mass.
Besly & Co., Charles H., 118-24 N. Clinton St., Chicago, Ill.
Brubaker & Bros., W. L., Millersburg, Pa.
Butterfield & Co., Derby Line, Vt.
Card Mfg. Co., S. W., Mansfield, Mass.
Carpenter Tap & Die Co., J. M., Pawtucket, R. I.
Conant & Donelson Co., Conway, Mass. "Reliable."
Duplex—See Hart Mfg. Co.
Economy—See Greenfield Tap & Die Corp.
Green River—See Greenfield Tap & Die Corp.
Greenfield Tap & Die Corp., Greenfield, Mass. "Little Giant," "Lightning," "Green River," "Economy." (See page 687.)
Hart Mfg. Co., 20 E. Third St., Cleveland, O. "Duplex."
Lightning—See Greenfield Tap & Die Corp.
Little Giant—See Greenfield Tap & Die Corp.
Lowell Wrench Co., 54 Commercial St., Worcester, Mass.
Pratt & Whitney Co., 111 Broadway, New York, N. Y. (See page 73.)
Reliable—See Conant & Donelson.
Thistle—See Winter Bros. Co.
Winter Bros. Co., Kendrick St., Wrentham, Mass. "Thistle."

STOPPERS, GLARE—See Dimmers, Glare

STORAGE BATTERIES — See Batteries, Storage

STORAGE BATTERY ACID—See Electrolyte, Storage Battery

STORAGE BATTERY PLATE PRESSES—See Presses, Storage Battery Plate

STORAGE BATTERY SEPARATORS—See Separators, Storage Battery

STORAGE BATTERY STEAMERS — See Steamers, Storage Battery

STORAGE BATTERY TURNTABLES—See Turntables, Storage Battery

STORAGE SYSTEMS—See Tanks and Systems, Gasoline Storage

STORAGE TANKS—See Tanks and Systems, Gasoline Storage

STOVE BOLTS—See Bolts, Tire

STOVES, Camp

American Gas Machine Co., 731 Clark St., Albert Lea, Minn.
Boyle Mfg. Co., Santa Fe Ave. & 51st St., Los Angeles, Cal.
Mazura Mfg. Co., 414 S. Sixth St., St. Louis, Mo.
Moats—See Prentiss-Wabers Mfg. Co.
Moore, Leslie E., 1042 S. Olive St., Los Angeles, Cal.
Prentiss-Wabers Mfg. Co., 20 Spring St., Grand Rapids, Wis. "Moats."
Prest-O-Lite Co., Indianapolis, Ind. (See page 89.)
Red-E Co., 20 E. Broad St., Columbus, O.

STRAIGHTENING MACHINES — See Machines, Leaf Spring Straightening

STRAIGHTENING PRESSES—See Presses, Bench Straightening

STRAINERS, CARBURETOR INTAKE—See Cleaners, Air

STRAINERS or SEPARATORS, Gasoline

(For use between tank and carbureter to remove dirt and water; for Strainer Funnels—See Funnels, Gasoline)

Allen Wrench & Tool Co., Public & Eddy Sts., Providence, R. I.
American Brass & Iron Co., Detroit, Mich. (See page 153.)
Attwood Brass Works, Grand Rapids, Mich. (See page 531.)
Breeze Mfg. Co., 250-52 South St., Newark, N. J.
Bush Mfg. Co., Hartford, Conn. (See page 573.)
Columbia Gasoline Filter Co., 28 Kingston St., Boston, Mass.
Commonwealth Brass Corp., Commonwealth Ave. & Grand Trunk Ry., Detroit, Mich.
Crum-Wiley Mfg. Co., Peru, Ind.
Eisenbrandt, F. B., Light St., Baltimore, Md.
Findeisen & Kropf Mfg. Co., 21st & Rockwell Sts., Chicago, Ill. "Rayfield." (See page 147.)
G. & A. Carbureter Co., 105-07 E. 12th St., New York, N. Y.
Gleason-Peters Air Pump Co., 384 Classon Ave., Brooklyn, N. Y.
Halladay Co., L. P., 501 N. Monroe St., Streator, Ill.
Hancock Mfg. Co., 770 Henry St., Charlotte, Mich.
Holtzer-Cabot Electric Co., Roxbury, Mass.
Imperial Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill. (See page 733.)
Lunkenheimer Co., Beekman & Waverly Sts., Cincinnati, O. "Trusty."
McRae & Roberts Co., 211-35 Campbell Ave., Detroit, Mich.
Michigan Lubricator Co., Detroit, Mich. (See page 195.)
Mosler & Co., A. R., Mt. Vernon, N. Y.
National Separator & Machine Co., 89 State St., Boston, Mass.
Powell Co., Wm., 2525 Spring Grove Ave., Cincinnati, O. (See page 195.)
Rayfield—See Findeisen & Kropf Mfg. Co.
Roberts Brass Mfg. Co., 1395-1407 Fort St. W., Detroit, Mich.
Sage Bros., 780 Union St., Brooklyn, N. Y. "Sasco." (See page 665.)
Sasco—See Sage Bros.
Storm Mfg. Co., Dept. D., Thompson, Ia. (See page 621.)
Stromberg Motor Devices Co., Dept. 1020, 64 E. 25th St., Chicago, Ill. (See page 151.)
Trusty—See Lunkenheimer Co.
Western Brass Mfg. Works, Marshall Blvd., 21st St. & C. B. & Q. R. R., Chicago, Ill.
Wheeler-Schebler Carburetor Co., Indianapolis, Ind. (See page 147.)

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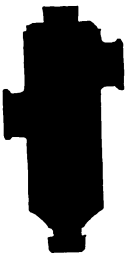
Motor SASCO Strainer



Keeps Dirt and Water Out of the Carbureter

This means a steadier running motor and the elimination of many mysterious stops while on the road. Motorists have learned that a good gasoline strainer is an absolute necessity, and so thousands are sold every day. How many are you selling?

Size	Width	Height	Pipe Size	Price
No. 00	1⅞ in.	3¾ in.	⅛ in.	$3.00
No. 0	2⅛ in.	5 in.	¼ in.	$4.00

NOTE.—On Special Order the No. 0 strainer can be furnished with tappings from ⅛ in. to ⅜ in. The Strainer Baskets are furnished with No. 80 Mesh BRONZE WIRE CLOTH. Catalogs and descriptive circulars of LARGER SIZE STRAINERS will be MAILED ON APPLICATION.

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LARGER SIZES FOR ALL PURPOSES

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THE ELHAR METALS

Elhar Special High-Speed Steel.

Elhar Steels in Carbon and Alloys.

Pure Nickel Sheets, Wires and Rods.

Elhar Steel Balls.

Spark Plug Wire.

Copper, Nickel and Brass Plated Zinc Strips and Sheet to take place of Copper, Steel and Brass Strip for Stamping, etc.

Wires and Ribbon in all metals, fine sizes especially.

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Welding Wires, all grades.

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Wire Gauze

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Gasoline and Oil Strainers

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Strainer Baskets

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Especially Equipped shop for handling big contracts.

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LIGHT AND HEAVY

STAMPED METAL PARTS

FOR AUTOMOBILES

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Worcester, Massachusetts

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STRAP BUCKLES—See Buckles, Strap

STRAP LOOPS—See Loops, Brass Snap

STRAP SNAPS—See Hooks, Snap

STRAPS, Anti-Rattling Hood

(Leather or web straps with spiral spring to put over engine hoods to prevent their rattling)

Campbell—See Perkins Campbell Co.

Hoover Co., W. H., New Berlin, O.

Perkins-Campbell Co., 634 Broadway, Cincinnati, O. "Campbell." (See page 227.)

Winship, W. W., 71 Summer St., Boston, Mass.

STRAPS, HOOD—See Straps, Anti-Rattling Hood; also Straps, Leather

STRAPS, Leather

Ajax Trunk & Sample Case Co., 144-50 W. 18th St., New York, N. Y.

B. E. Mfg. Co., 18-22 W. 18th St., New York, N. Y. (See page 223.)

Backstay Machine & Leather Co., Oak & Howard Sts., Union City, Ind.

Badger Handle Co., Kuppmeier Bldg., Milwaukee, Wis.

Bailey Co., R. B., 1316 S. Grand Ave., Los Angeles, Cal.

Bond Co., Charles, 520 Arch St., Philadelphia, Pa. "Fabritex."

Brace Leather Goods Co., 22 Wayne St., Pontiac, Mich.

Bunge Co., Otto, 1052 Dawson St., Indianapolis, Ind.

Campbell—See Perkins, Campbell Co.

Carter Co., George R., 1600-20 Kentucky Ave., Connersville, Ind.

Chicago Wholesale Saddlery & Mfg. Co., 125-27 N. Halsted St., Chicago, Ill.

Decker, J. C., Montgomery, Pa.

Desoco—See Detroit Socket Co.

Detroit Socket Co., 814 Jefferson Ave., W., Detroit, Mich. "Desoco."

Duckwall Belting & Hose Co., 201-05 N. West St., Indianapolis, Ind. (See page 469.)

Economy Stay Co., Jefferson City, Mo.

Ettinger Mfg. Co., 49-61 Clymer St., Brooklyn, N. Y. (See page 101.)

Fabritex—See Bond Co.

Feeser Co., Frank S., 1102 Prospect St., Indianapolis, Ind. "Superior."

G. & K.—See Graton & Knight Mfg. Co.

Graton & Knight Mfg. Co., Worcester, Mass. "G. & K." (See page 99.)

Hager & Son, Chas., 1926 Broadway, New York, N. Y.

Hide, Leather & Belting Co., 215 S. Meridian St., Indianapolis, Ind. (See page 389.)

Hoffeld & Co., R., 61-69 Carroll St., Buffalo, N. Y.

Hoover Co., W. H., New Berlin, O.

Jewell Belting Co., 15 Trumbull St., Hartford, Conn.

Kelley, A. F., 178 S. Main St., Providence, R. I.

Kronauer & Co., Chas., 152 N. Desplaines St., Chicago, Ill.

Leather Products Co., 715 Carr St., Cincinnati, O.

Lefkowitz & Bro., L., 1 Greene St., New York, N. Y.

Mooney Belting Co., 844 W. Sixth St., Cincinnati, O.

Nathan Novelty Mfg. Co., 84-90 Reade St., New York, N. Y. (See page 153.)

National Leather Mfg. Co., Niles, Mich.

Page Belting Co., Concord, N. H.

Perkins-Campbell Co., 634 Broadway, Cincinnati, O. "Campbell." (See page 227.)

Reinhold Belting & Supply Co., 499 Atlantic Ave., Brooklyn, N. Y.

Rhoads & Sons, J. E., 12 N. Third St., Philadelphia, Pa.

Specialty Harness Co., Dayton, Va.

Springfield Harness Co., 55-61 Dwight St., Springfield, Mass.

Stevens & Bro., A. A., 1234 Wabash Ave., Chicago, Ill.

Strecker Bros. Co., 117-19 Putnam St., Marietta, O.

Superior—See Feeser Co.

Sutherland Co., F. L., 139 Beaubien St., Detroit, Mich. (See page 523.)

Wakefield Sales Co., Trempealeau, Wis.

Warren Leather Goods Co., 80 Austin St., Worcester, Mass.

Wsco—See Williamsport Leather Goods Co.

Williamsport Leather Goods Co., 944 Nichols Pl., Williamsport, Pa. "Wsco."

Wing Co., Charles, Amesbury, Mass. (See page 645.)

STRAPS, Rebound

(See also Shock Absorbers; also Springs, Supplementary)

Badger Handle Co., Kuppmeier Bldg., Milwaukee, Wis.

Brace Leather Goods Co., 22 Wayne St., Pontiac, Mich.

Buckeye—See Central Brass & Fixture Co.

Bunge Co., Otto, 1052 Dawson St., Indianapolis, Ind.

Carter Co., George R., 1600-20 Kentucky Ave., Connersville, Ind.

Central Brass & Fixture Co., Dept. A., Springfield, O. "Buckeye." (See page 137.)

Curry Co., J. W., 2615 Cummins St., Cincinnati, O.

Feeser Co., Frank S., 1102 Prospect St., Indianapolis, Ind. "Superior."

G. & K.—See Graton & Knight Mfg. Co.

Geisel, Otto E., 3202-06 Oxford St., Philadelphia, Pa. (See page 101.)

Gilmer Co., L. H., Philadelphia, Pa. (See page 103.)

Graton & Knight Mfg. Co., Worcester, Mass. "G. & K." (See page 99.)

Hoover Co., W. H., New Berlin, O.

McGregor—See U. S. Auto Bumper Co.

Mesinger Mfg. Co., H. & F., Austin Pl. & E. 144th St., New York, N. Y.

Perkins-Campbell Co., 634 Broadway, Cincinnati, O. (See page 227.)

Sierra—See Sturges Co.

Smith Belting Co., Manning J., 39 E. Ashmead St. (Germantown), Philadelphia, Pa. (See page 101.)

Sturges Co., V. K., 26th & Union Sts., Oakland, Cal. "Sierra."

Superior—See Feeser Co.

Sutherland Co., F. L., 139 Beaubien St., Detroit, Mich. (See page 523.)

U. S. Auto Bumper Co., 115 E. 30th St., Chicago, Ill. "McGregor."

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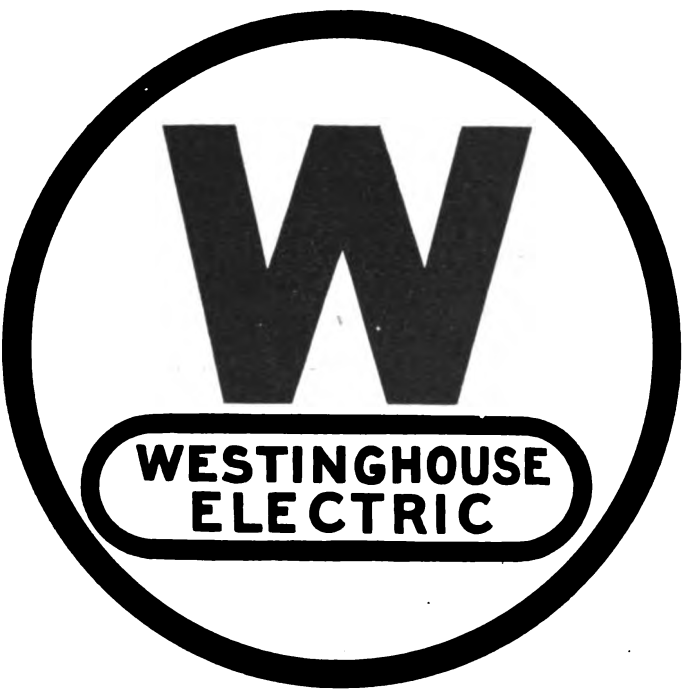
Automotive Electric Equipment

For

Automobiles **Air Planes**
Trucks **Motor Boats**
Tractors **Locomotives**



Westinghouse Electric & Mfg. Co.

Automobile Equipment Department

General Sales Offices: 110-114 West 42nd St., New York

Works: Newark, N. J.

Cleveland, Ohio **Detroit, Mich.** **Indianapolis, Ind.**

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STRAPS, Rebound, for Fords

(See also Shock Absorbers; also Springs, Supplementary)

G. & K.—See Graton & Knight Mfg. Co.

Geisel, Otto E., 3202-06 Oxford St., Philadelphia, Pa. (See page 101.)

Gilmer Co., L. H., Philadelphia, Pa. (See page 103.)

Graton & Knight Mfg. Co., Worcester, Mass. "G. & K." (See page 99.)

Hoover Co., W. H., New Berlin, O.

Mesinger Mfg. Co., H. & F., Austin Pl. & E. 144th St., New York, N. Y.

Nelson Mfg. Co., A., 2700 Southport Ave., Chicago, Ill.

Perkins-Campbell Co., 634 Broadway, Cincinnati, O. (See page 227.)

STRAPS, Robe

(Adjustable strap to be worn around the waist and fastened to robe to hold it in place)

Parks Mfg. Co., 236 Aborn St., Providence, R. I.

STRAPS, STARTING CRANK—See Holders, Starting Crank

STRAPS, Web

American Mills Co. of New York, 395 Broadway, New York, N. Y.

Buffalo Weaving & Belting Co., 234 Chandler St., Buffalo, N. Y.

Curry Co., J. W., 2615 Cummins St., Cincinnati, O.

Dafoe-Eustice Co., 1164-72 W. Jefferson Ave., Detroit, Mich. "Deco." (See page 227.)

Deco—See Dafoe-Eustice Co.

Kerr Adjustable Strap Co., 40 Cedar St., New York, N. Y.

Powers Mfg. Co., 1340 Sycamore St., Waterloo, Ia.

Russell Mfg. Co., Middletown, Conn. (See page 415.)

Sutherland Co., F. L., 139 Beaubien St., Detroit, Mich. (See page 523.)

STREAMLINING, Aeroplane Rubber Wire

Dural Rubber Corp., Maple Ave., Flemington, N. J.

Goodyear Tire & Rubber Co., Akron, O. (See page 861.)

STRIPS, Spring Leaf Lubricating

(Composition lubricating strips to place between spring leaves to prevent squeaking; for Spring Leaf Oilers—See Cups and Covers, Spring Leaf Lubricating; for Spring Leaf Separating Tools—See Tools, Spring Leaf Separating)

Avery—See Northwestern Chemical Co.

Avery Portable Lighting Co., 351 National Ave., Milwaukee, Wis.

Dann Products Co., 1096 E. 152d St., Cleveland, O.

Hall-Thompson Co., Hartford, Conn. "Wonder Worker." (See page 739.)

Northwestern Chemical Co., 610 State St., Marietta, O. "Norwesco," "Avery." (See page 205.)

Norwesco—See Northwestern Chemical Co.

Spiller Co., H. A., 55 Elm St., Boston, Mass. "Springeze."

Springeze—See Spiller Co.

Wonder Worker—See Hall-Thompson Co.

STRIPS, Wind Shield Weather

Akron Auto Garage Co., 26 E. Buchtell St., Akron, O.

Continental Rubber Works, 1902 Liberty St., Erie, Pa.

Motor Products Corporation, Detroit, Mich. (See page 231.)

Petley Rubber Mfg. Co., 241 Oregon St., Milwaukee, Wis. (See page 453.)

Tri-Continental Corp., 702 Main St., Buffalo, N. Y.

STRIPS, Wood Door Finishing, for Fords

(Polished wood strips for tops of doors)

London Auto Supply Co., 2548 Wabash Ave., Chicago, Ill.

STRIPS, WOOD MOLDING — See Parts, Wood Automobile

STRIPS, WOOD TACKING — See Parts, Wood Automobile

STRUT ENDS, AEROPLANE — See Ends, Aeroplane Strut

STRUT FORMING MACHINES — See Lathes, Aeroplane Strut

STRUT LATHES, AEROPLANE — See Lathes, Aeroplane Strut

STRUTS, AEROPLANE—See Parts, Wood

STRUTS, STEERING GEAR—See Checks, Steering Gear

STUD BOLT EXTRACTORS—See Extractors, Stud Bolt

STUFFING BOXES, MOTOR BOAT—See Boxes, Motor Boat Stuffing

SUIT CASE HOLDERS—See Holders, Suit Case or Luggage

SUPPLEMENTARY SEATS — See Seats, Supplementary

SUPPLEMENTARY SPRINGS—See Springs, Supplementary

SUPPLIES, Dealers and Jobbers in

(Comprising only Dealers and Jobbers in Automobile Supplies who advertise in this publication)

Auto Auction Co., 517-19 W. Jackson Blvd., Chicago, Ill. (See page 133.)

Auto Tire Sales Co., 1346-48 Michigan Ave., Chicago, Ill. (See page 773.)

Gray-Heath Co., 1440 S. Michigan Ave., Chicago, Ill. (See inside Back Cover.)

Hill-Smith Metal Goods Co., Dept. H, Boston, Mass. (See page 221.)

Martin, James, 106 West 52d St., New York, N. Y. (See page 719.)

Motor Electrical Equipment Co., 1251 S. Michigan Ave., Chicago, Ill. (See page 483.)

Motor Parts Co., 843 N. Broad St., Philadelphia, Pa. (See page 459.)

Pruden Hardware Co., W. E., 864-66 Eighth Ave., New York, N. Y. (See page 531.)

Reinhard Bros. Co., 11-13 S. Ninth St., Minneapolis, Minn. (See page 601.)

Zinke Co., 1323-25 Michigan Ave., Chicago, Ill. (See pages 543 to 552.)

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AND TYPES

CITY AUTO TIRE & SUPPLY CO.

Chester Ave. & E. 24th St.

CLEVELAND OHIO

SHEET METAL STAMPING

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CUTTER & WOOD SUPPLY CO.
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We specialize on Hickory, Ash, Oak, Auto Rims. All sizes. Second Growth White Ash Auto Bows. Tacking Strips for Metal Bodies.

Let us estimate on your requirements.

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SUPPLIES, Foundry

Brass Founders Supply Co., Hamburg Pl. nr. Ave. L, Newark, N. J.
Coleman Foundry Equipment Co., 2102-18 Abbey Ave., Cleveland, O.
Hill & Griffith Co., C. H. & D. Ry. & Gest St., Cincinnati, O.
Niagara Devices, Buffalo, N. Y.
Obermayer Co., S., 647 Ebans St., Cincinnati, O.
Stevens, Frederic B., Detroit, Mich. (See page 776.)
Woodison Co., E. J., 53 Buhl Blk., Detroit, Mich.

SUPPLY JOBBERS—See Jobbers, Supply

SUPPORTS, Brake Rods, for Fords

(To prevent rattling of brake rods)

Affa Specialty Co., 34 Southbridge St., Worcester, Mass.
Apco Mfg. Co., Eddy St., Providence, R. I.
Benford Mfg. Co., Box H, Mt. Vernon, N. Y. (See page 517.)
Brown Co., 213 Bellevue Ave., Syracuse, N. Y.
Crum-Wiley Mfg. Co., Peru, Ind.
Edelmann & Co., E., 341-63 E. Ohio St., Chicago, Ill.
Evergood—See Grossman Mfg. Corp.
Grossman Mfg. Corp., Emil, Bush Terminal Bldg. No. 20, Brooklyn, N. Y. "Evergood."
Hill, H. E., Galesburg, Mich.
Humboldt Machine & Stamping Co., 81-85 Tenth St., Long Island City, N. Y.
Illinois Brass Mfg. Co., 226-30 W. Ontario St., Chicago, Ill.
Metal Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.
Mosco—See Motor Specialties Co.
Motor Specialties Co., Pine St., Waltham, Mass. "Mosco."
Nelson Mfg. Co., A., 2700 Southport Ave., Chicago, Ill.
Whitehouse-LeCompte Mfg. Co., 42-54 Elm St., Newark, N. J.

SUPPORTS, CAR—See Jacks, Tire Saving

SUPPORTS or ARCH BARS, Hood

(Formed metal bar or ledge to fasten to dash board to carry rear end of engine hood)

Crosby Co., Buffalo, N. Y. (See page 669.)
Konigslow Mfg. Co., Otto E., 3701 Perkins Ave., Cleveland, O.
Metal Specialty Co., Cincinnati, O.
Moline Pressed Steel Co., East Moline, Ill.

SUPPORTS, RADIATOR, FOR FORDS—See Cradles, Radiator

SURFACE GAGES—See Gages, Surface

SURFACE GRINDERS—See Grinders, Surface

SWEDGING PRESSES—See Presses, Bushing Swedging

SWING FRAME GRINDERS—See Grinders, Swing Frame

SWITCH CONTROLS FOR FORDS—See Controls, Ignition Switch

SWITCH KEYS FOR FORDS—See Keys, Switch

SWITCH LOCKS—See Locks, Switch and Coil

SWITCHES, Automatic Cut-Out

(For cutting out lights automatically when motor is not running)

Price Electric Devices Corp., Waynesboro, Va.

SWITCHES, ELECTRIC LOCK — See Switches, Lock

SWITCHES, ELECTRIC LOCK, FOR FORDS—See Locks, Switch and Coil

SWITCHES, Electric Starter

(See also Starters, Electric)

Briggs & Stratton Co., Hopkins & Lewis Sts., Milwaukee, Wis.
Cuno Engineering Corp., 80 S. Vine St., Meriden, Conn.
Diamond H.—See Hart Mfg. Co.
H & H—See Hart & Hegeman Mfg. Co.
Hart Mfg. Co., Hamilton St., Hartford, Conn. "Diamond H."
Hart & Hegeman Mfg. Co., 242 Capitol Ave., Hartford, Conn. "H & H"
Hartman Electrical Mfg. Co., 31 E. Fifth St., Mansfield, O.
Industrial Controller Co., 836 Greenbush St., Milwaukee, Wis.

SWITCHES, Horn

(Special horn switch for attaching to steering column below the wheel and devised so it can be operated without removing the hands from the wheel)

Seng Auto Device Co., 1305 Michigan Blvd., Chicago, Ill.

SWITCHES, Ignition

Alsop Triple Ignition Corp., 1765 Broadway, New York, N. Y. (See page 523.)
Ampco—See S-M Novelty Mfg. Co.
Atwater Kent Mfg. Works, 4937 Stenton Ave., Philadelphia, Pa.
Briggs & Stratton Co., Hopkins & Lewis Sts., Milwaukee, Wis.
Brock Rubber Co.—See Zinke Co.
Chicago Electric Mfg. Co., 2817 S. Halsted St., Chicago, Ill. "Handy."
Clum Mfg. Co., 23-25 Erie St., Milwaukee, Wis.
Connecticut Telephone & Electric Co., Meriden, Conn. (See pages 676 and 677.)
Couch Co., S. H., 170 Purchase St., Boston, Mass. "Puritan."
Dow Mfg. Co., 131 Adams St., Braintree, Mass.
Fahnestock Electric Co., Hunters Point, Long Island City, N. Y.
Faultless—See Motsinger Device Mfg. Co.
Handy—See Chicago Electric Mfg. Co.
Hubbell, Harvey, State St. & Bostwick Ave., Bridgeport, Conn.
Ideal Switch Co., Plainville, Conn.
Kingston—See Kokomo Electric Co
Kokomo Electric Co., 1415 Webster St., Kokomo, Ind. "Kingston."
Morse, Frank W., 289 Congress St., Boston, Mass. (See page 453.)
Motsinger Device Mfg. Co., Lafayette, Ind. "Faultless."

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Try us when your regular dealer cannot supply you.

IRON AND STEEL SHAPES AND BARS
IRON AND STEEL SHEETS
MACHINE TOOLS
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ARTHUR J. DUNKLE COMPANY
Hudson Terminal
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Auto Tops

with their graceful lines and coverings of color harmony, are the season's vogue.

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For Electric Lamps
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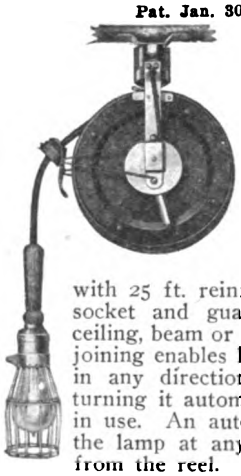

Especially adapted for use in Manufacturing Plants, Garages, Machine Shops, etc., and a great convenience for adjustable extensions for portable electric drills, grinders, fans, etc. Equipped with 25 ft. reinforced cord, lamp socket and guard. Attached to ceiling, beam or conduit. A swivel joining enables lamp to be carried in any direction from Reel, returning it automatically when not in use. An automatic lock holds the lamp at any desired distance from the reel.

Perfect insulation—stands test of an A. C. Potential of 1250 volts—only 250 volts required for lamp service. Safe—satisfactory—convenient—necessary.
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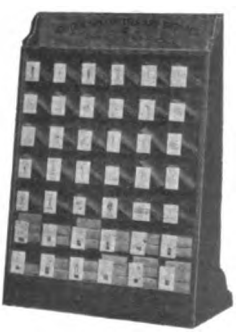

EASTERN PARTS MFG. CO. Inc.
135 Spring Street New York City

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SWITCHES, Ignition (Continued)

New York Coil Co., 338-40 Pearl St., New York, N. Y.

Picard & Co., A. J., 9 W. 61st St., New York, N. Y. (Metropolitan Distributors for Chicago Switches.) "Handy." (See page 273.)

Puritan—See Couch Co.

Quick Action Ignition Co., South Bend, Ind.

Rosco—See Rosen & Co.

Rosen & Co., A. W., 610-14 Broadway, New York, N. Y. "Rosco."

S-M Novelty Mfg. Co., 52d St. & Baltimore Ave., Philadelphia, Pa. "Ampco."

Splitdorf Electrical Co., Newark, N. J.

Wells Mfg. Co., R. C., Fond du Lac, Wis.

Zinke Co., 1323-25 Michigan Ave., Chicago, Ill. (Sole Distributors for A. S. Brock Rubber Co., Boston, Mass.)

SWITCHES, KICK—See Switches, Ignition

SWITCHES, Light

(For turning on and off electric lights on car)

Briggs & Stratton Co., Hopkins & Lewis Sts., Milwaukee, Wis.

Brock Rubber Co.—See Zinke Co.

Chapman—See Morse, Frank W.

Chicago Electric Mfg. Co., 2817 S. Halsted St., Chicago, Ill. "Handy."

Clum Mfg. Co., 23-25 Erie St., Milwaukee, Wis.

Connecticut Telephone & Electric Co., Meriden, Conn. (See pages 676 and 677.)

Cowles & Co., C., New Haven, Conn. (See page 339.)

Culver-Stearns Mfg. Co., Detroit, Mich. (See page 381.)

Cuno Engineering Corp., 80 S. Vine St., Meriden, Conn.

Cutler Hammer Mfg. Co., 890 St. Paul Ave., Milwaukee, Wis.

Diamond H—See Hart Mfg. Co.

Eureka—See Morse, Frank W.

Faw, J. H., 37 Warren St., New York, N. Y. (Eastern and Southern Distributor for Culver-Stearns Switches.) (See page 387.)

General Electric Co., Schenectady, N. Y. (See pages 564 and 565.)

H & H—See Hart & Hegeman Mfg. Co.

Handy—See Chicago Electric Mfg. Co.

Hart Mfg. Co., Hamilton St., Hartford, Conn. "Diamond H."

Hart & Hegeman Mfg. Co., 342 Capitol Ave., Hartford, Conn. "H. & H."

Hartman Electrical Mfg. Co., 31 E. Fifth St., Mansfield, O.

Higginson-Gibson Mfg. Co., 74 Atlantic St., Boston, Mass.

Hubbell, Harvey, State St. & Bostwick Ave., Bridgeport, Conn.

Ideal Switch Co., Plainville, Conn.

L-N—See Leece-Neville Co.

Leece-Neville Co., 5363 Hamilton Ave., Cleveland, O. "L-N."

Morse, Frank W., 289 Congress St., Boston, Mass. "Chapman," "Eureka," "Puritan," "Pullrite," "Starite." (See page 453.)

North East Electric Co., Rochester, N. Y. (See pages 265 to 268.)

O'Brien Mfg. Co., Joseph F., 391 Broadway, New York, N. Y.

Picard & Co., A. J., 9 W. 61st St., New York, N. Y. (Metropolitan Distributors for Chicago Switches.) "Handy." (See page 273.)

Pullrite—See Morse, Frank W.

Puritan—See Morse, Frank W.

Rosco—See Rosen & Co.

Rosen & Co., A. W., 610-14 Broadway, New York, N. Y. "Rosco."

Starite—See Morse, Frank W.

Westinghouse Electric & Mfg. Co. (E. Liberty), Pittsburgh, Pa.

Zinke Co., 1323-25 Michigan Ave., Chicago, Ill. (Sole Distributors for A. S. Brock Rubber Co., Boston, Mass.)

SWITCHES, Lock

(Ignition switches equipped with lock to prevent unauthorized use of car)

Blacolock—See Cox Mfg. Co.

Bo-Hart Auto & Machine Co., Lancaster, N. Y.

Clum Mfg. Co., 23-25 Erie St., Milwaukee, Wis.

Combination Auto Lock Co., St. Louis, Mo. "Comco."

Comco—See Combination Auto Lock Co.

Connecticut Telephone & Electric Co., Meriden, Conn. (See pages 676 and 677.)

Cox Mfg. Co., 3415 Perkins Ave., Cleveland, O. "Blacolock," "Motolok." (See page 421.)

Davis—See National Auto Combination Lock Co.

Delta-Star Electric Co., 617-61 W. Jackson Blvd., Chicago, Ill.

Esco Mfg. Co., 23-25 Warren Ave. W., Detroit, Mich.

Everett Mfg. Co., 162-64 N. May St., Chicago, Ill.

Goodrich-Lenhart Mfg. Co., 429 Widener Bldg., Philadelphia, Pa. (See page 111.)

Hubbell, Harvey, State St. & Bostwick Ave., Bridgeport, Conn.

Motolok—See Cox Mfg. Co.

Motors Lock Co. of America, Craig St. & Baum Blvd., Pittsburgh, Pa. "Spark-No."

National Auto Combination Lock Co., Plaza Bldg., Oakland, Cal. "Davis."

Safety Device Co., 372 S. Illinois St., Indianapolis, Ind.

Sly Mfg. Co., W. W., Cleveland, O.

Spark-No—See Motors Lock Co. of America.

SWITCHES, LOCK, FOR FORDS — See Locks, Switch and Coil

SWITCHES, Spark Plug

(Small switches for attaching to spark plug to facilitate the testing of the ignition)

Bailey Co., W. J., Newark, N. J. "C. B."

C. B.—See Bailey Co.

Locke Mfg. Co., Ravenna, O.

Means, Eugene D., Towanda, Pa.

SWITCHES, Steering Wheel

(Ignition Switches for attachment to Steering Wheel)

Connecticut Telephone & Electric Co., Meriden, Conn. (See pages 676 and 677.)

Culver-Stearns Mfg. Co., Detroit, Mich. (See page 381.)

Faw, J. T., 37 Warren St., New York, N. Y. (Eastern and Southern Distributor for Culver-Stearns Switches.) (See page 387.)

SWIVEL JOINTS—See Joints, Speedometer Swivel

SWIVEL LAMPS—See Lights, Spot

SWIVEL LIGHTS—See Lights, Spot

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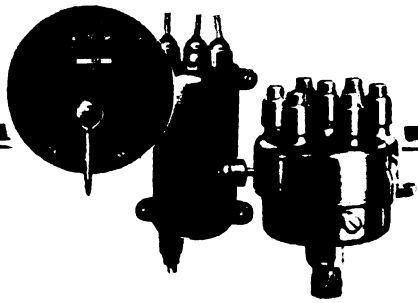

PHILBRIN

DUPLEX IGNITION

—with a second system to spur the motor to super-service.

In this system the highest possible ignition efficiency is secured by the combination, in one instrument, of two separate and complete ignition systems—the Philbrin Single Spark system and the Philbrin High Frequency system. Either system is instantly available by the turn of a switch.

Philbrin Single Spark ignition builds up its hottest spark at low speeds when carburetion is poorest. But at all speeds the intensity of the spark is so effective as to even insure ignition of leaner gasoline mixtures—thus increasing power while saving fuel.

Philbrin High Frequency ignition delivers a shower of sparks of remarkable intensity to each cylinder in its firing order—sparks produced at the rate of over 60,000 a minute. This rapid rush of sparks will ignite almost any mixture under almost any conditions.

This system successfully overcomes adverse or emergency conditions, such as starting or running a cold motor, low grade gasoline, faulty carburetor adjustment, carbonized cylinders and unusual uphill grades.

Easy to install on any car. Moderately priced. An unusual sales proposition is open to jobbers and dealers.

PHILIPS-BRINTON COMPANY

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SWIVEL SEARCHLIGHTS — See Lights, Spot

SYSTEM BOOKS—See Books, Accounting and Cost Systems

SYSTEMS, ACCOUNTING—See Books, Accounting and Cost Systems

SYSTEMS, BILLING—See Books, Accounting and Cost Systems

SYSTEMS, COST—See Books, Accounting and Cost Systems

SYSTEMS, Electric Lighting

(See also Dynamos, Electric Lighting; also Starters, Electric)

Dayton Engineering Laboratories Co., 329 E. First St., Dayton, O. "Delco."

Delco—See Dayton Engineering Laboratories Co.

Dyneto Electric Corp., Syracuse, N. Y. (See page 269.)

Gray & Davis, Boston, Mass. (See page 651.)

Henricks Magneto & Electric Co., 1200 St. Paul St., Indianapolis, Ind.

Holtzer-Cabot Electric Co., Roxbury, Mass.

Ita Manufacturers, Glen Ellyn, Ill. (See page 495.)

L-N—See Leece-Neville Co.

Leece-Neville Co., 5363 Hamilton Ave., Cleveland, O. "L-N."

Leonard Electric Co., Ward, Mt. Vernon, N. Y.

North East Electric Co., Rochester, N. Y. (See pages 265 to 268.)

Vesta Accumulator Co., 2100 Indiana Ave., Chicago, Ill.

Westinghouse Electric & Mfg. Co., 110-14 W. 42d St., New York, N. Y. (See page 667.)

SYSTEMS, GASOLINE FEED—See Tanks Vacuum; also Systems, Magnetic Pump; also Regulators, Tank Pressure

SYSTEMS, GASOLINE STORAGE — See Tanks, Fuel Storage

SYSTEMS, IGNITION—See Coils, Spark; also Timers; also Magnetos; also Systems, Single Spark; also Starters, Electric

SYSTEMS, KEROSENE, FOR FORDS—See Carbureters, Kerosene; also Heaters, Mixture; also Manifolds, Special and Jacketed

SYSTEMS, LIGHTING—See Systems, Electric Lighting

SYSTEMS, Magnetic Pump Gasoline

(For Vacuum Tanks—See Tanks, Vacuum)

Motor Cooling System Co., Charles & Lombard Sts., Baltimore, Md.

SYSTEMS, Single Spark Ignition

(For combined ignition and starting Systems—See Starters, Electric)

Akar Ignition Co., 149 W. Berkley St., Philadelphia, Pa.

Atwater Kent Mfg. Works, 4937 Stenton Ave., Philadelphia, Pa. "Unisparker."

Connecticut Telephone & Electric Co., Meriden, Conn. (See pages 676 and 677.)

Dayton Engineering Laboratories Co., 329 E. First St., Dayton, O. "Delco."

Delco—See Dayton Engineering Laboratories Co.

Kingston—See Kokomo Electric Co.

Kokomo Electric Co., 1415 Webster St., Kokomo, Ind. "Kingston."

New York Coil Co., 338-40 Pearl St., New York, N. Y. "Rhoades."

Philbrin—See Philips-Brinton Co.

Philips-Brinton Co., S. Broad St. & Pennsylvania Ave., Kennett Square, Pa. "Philbrin." (See page 673.)

Remy Electric Co., 1623 E. Grand Blvd., Detroit, Mich.

Rhoades—See New York Coil Co.

Unisparker—See Atwater Kent Mfg. Works.

SYSTEMS, Single Spark Ignition, for Fords

(For combined ignition and starting systems—See Starters, Electric)

Atwater Kent Mfg. Works, 4937 Stenton Ave., Philadelphia, Pa.

Connecticut Telephone & Electric Co., Meriden, Conn. (See pages 676 and 677.)

New York Coil Co., 338-40 Pearl St., New York, N. Y. "Rhodes."

Philbrin—See Philips-Brinton Co.

Philips-Brinton Co., S. Broad St. & Pennsylvania Ave., Kennett Square, Pa. "Philbrin." (See page 673.)

Rhoades—See New York Coil Co.

Westinghouse Electric & Mfg. Co., 110-14 W. 42d St., New York, N. Y. (See page 667.)

SYSTEMS, Tractor Single Spark Ignition

Atwater Kent Mfg. Works, 4937 Stenton Ave., Philadelphia, Pa.

TABLES, LUNCH—See Tables, Picnic

TABLES, Picnic and Lunch

Puffer-Hubbard Mfg. Co., 26th St. & 32d Ave., S., Minneapolis, Minn.

TACKS, Upholstery

Atlas Tack Co., Fairhaven, Mass.

Brewer-Tichener Corp., 115 Port Watson St., Cortland, N. Y. "Lethermet."

Cleveland Tack Works, 1313 E. 49th St., Cleveland, O.

Cobb & Drew, Plymouth, Mass.

Crown—See Roberts, G. G.

Eagle—See Turner & Seymour Mfg. Co.

Genesee Tack Co., 89-57 Mt. Hope Ave., Rochester, N. Y.

Higgin Mfg. Co., Newport, Ky.

Interstate Iron & Steel Co., 104 S. Michigan Ave., Chicago, Ill.

Lethermet—See Brewer-Tichener Corp.

Leatherlike—See Turner & Seymour Mfg. Co.

Milonite—See Morley Mfg. Co.

Morley Mfg. Co., 120 Boylston St., Boston, Mass. "Milonite."

Neider Co., F. A., Augusta, Ky.

Plymouth Mills, Plymouth, Mass.

Reade, Chas. W., 346 Sherman Ave., New Haven, Conn.

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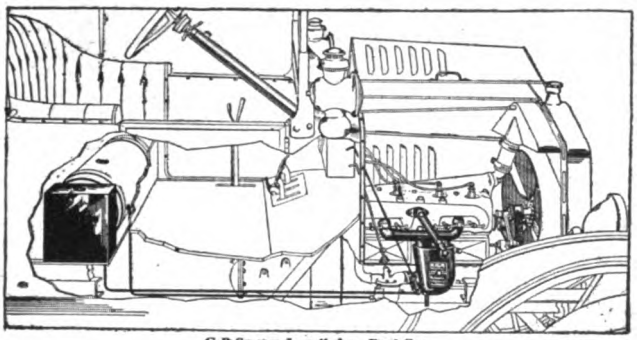
G-P Coal Oil System for Ford Cars



G-P System Installed on Ford Car.

This Device Is A Kerosene Gas Generator Not A Carburetor

USE KEROSENE AS FUEL—SAVE 60%

No Carbon Smoke Odor Trouble

What It Does For Ford Owners

- Cuts primary cost of fuel to about one-third of gasoline.
- Increases mileage per gallon 33%.
- Eliminates carbon and dirty spark plugs.
- Reduces consumption of lubricating oil.
- Causes engine to run smoother and prolongs life.
- Creates positive circulation of water at all times.
- Operates perfectly in zero weather or in hot weather.

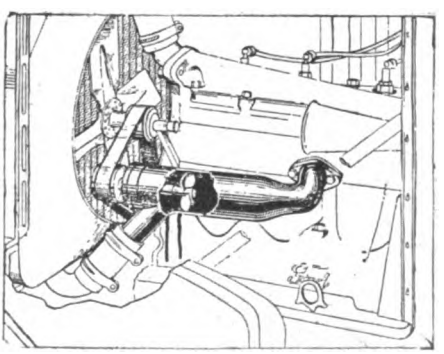
Increases Mileage Speed and Power

First and Only Kerosene Gas Generator with Official Sanction of American Automobile Assn.

Over 5000 Satisfied Users

A few of them: The Ford Co., Chicago, Chicago Police Dept., Tennes Laundry Co., J. L. Thompson Co., Chicago Packing House, South Shore Bakery Co., Chicago's Large Retail and Mail Order Houses.

Retail Price complete generator and water circulator $25.00



G. P. Water Circulator

WRITE FOR OUR LIBERAL SALES PROPOSITION

G. P. Sales Company, Chicago

1806 Michigan Ave.

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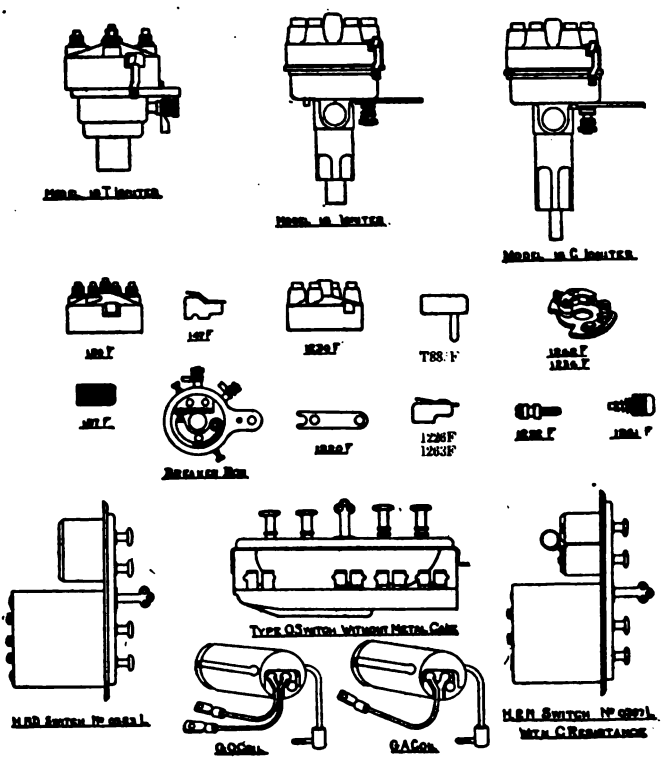
AUTOMATIC IGNITION CONNECTICUT

PARTS



PRICES

No. 504 Model 15-T Igniter—4 cyl.	$10.50
No. 506 Model 15-T Igniter—6 cyl.	11.00
Model 15 Breaker Box—4 & 6 cyl.	3.00
150-F 4 cyl. Model 15-T Distributor Case	2.75
151-F 6 cyl. Model 15-T Distributor Case	3.00
147-F 4 & 6 cyl. Model 15-T Distributor Arm.	.75
157-F Model 15-T Secondary Terminal	.07
Model 16 Igniter 4-cyl.	10.50
Model 16 Igniter 6 cyl.	11.00
Model 16 Igniter 8 cyl.	12.00
Model 16-C Igniter 4 cyl.	10.50
Model 16-C Igniter 6-cyl.	11.00
1230-F Model 16 & 16-C 4-cyl. Distributor Case	2.50
1231-F Model 16 & 16-C 6-cyl. Distributor Case	3.00
1232-F Model 16 & 16-C 8-cyl. Distributor Case	3.20
1236-F Model 16 & 16-C Breaker Plate	3.00
1262- Model 16 & 16-C 8-cyl. Breaker Plate.	$3.50
T885-F 7 m m. Elbow Secondary Terminal	.25
1220-F Model 16 & 16-C Advance Lever	.12
1226-F Model 16 & 16-C 4 & 6-cyl. Distributor Arm	.75
1263-F Model 16 & 16-C 8-cyl. Distributor Arm	.75
1252-F Model 16 & 16-C Secondary Slip Terminal	.04
1261-F Model 16 & 16-C Vaseline Cup	.15
Coil—Model GO	10.00
Coil—Model GA	10.00
Switch—H-ND No. 0383L with Lock	7.00
Switch—H-2N No. 0397L with lock and C resistance	7.00
Switch—No. 0310 Model O without case	7.00

CONNECTICUT TELEPHONE & ELECTRIC COMPANY
MERIDEN CONN.

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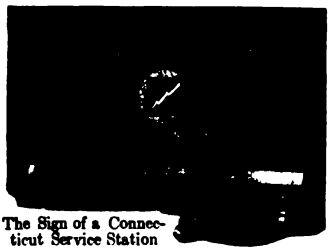

The Sign of a Connecticut Service Station

SERVICE

THE following concerns have been authorized as Service Stations for the inspection, care, maintenance and repair of Connecticut Automatic Ignition Systems.

Albany, N. Y.	Autoelectric Equipment & Repair Co.	
Albuquerque, N. M.	McCloskey Auto Co.	408 Copper Ave.
Arkansas City, Kan.	Mears Bros.	407 S. Summit St.
Atlanta, Ga.	Southern Auto & Equipment Co., Inc.	111 S. Forsyth St.
Baltimore, Md.	Richardson Auto Electric Corp.	1802 Morton St.
Birmingham, Ala.	The Electric Garage & Repair Co.	2016 Ave. B.
Boise, Idaho	Western Ignition & Battery Co.	119 S. 11th St.
Boston, Mass.	V. A. Nielsen Co.	390 Newbury St.
Brooklyn, N. Y.	P. J. Durham Co., Inc.	761 Park Place
Buffalo, N. Y.	Battery & Starter Co., Inc.	879 Main St.
Charleston, S. C.	Gas Engine & Electric Co.	174 King St.
Chicago, Ill.	Arthur Jones Electric Co.	2837 S. State St.
Cincinnati, Ohio	Boyle Engineering Co.	1042 Gilbert Ave.
Cleveland, Ohio	Cleveland Ignition Co.	1845 Euclid Ave.
Columbus, Ohio	Auto Electrical Supply Co.	231 N. 5th St.
Columbia, S. C.	Auto Electric Co., Inc.	1216 Hampton Ave.
Dallas, Tex.	Otto A. Hille Co.	1711 Young St.
Dayton, Ohio	Herbert F. Apple	427 E. 3rd St.
Davenport, Iowa	Emles Mfg. Co.	217 Iowa St.
Denver, Colo.	Elec. Service & Engineering Co.	1313-15 Broadway
Des Moines, Iowa	Bernhardt & Turner Auto Co.	506-12 W. 7th St.
Detroit, Mich.	Auto Electric Service Co.	11 Selden Ave.
El Paso, Tex.	Western Battery & Magnetic Co.	314 E. Blvd. St.
Erie, Pa.	Electric Batt. & Construction Co.	206-8 E. 12th St.
Fort Worth, Tex.	Starter Service Co.	283 W. 10th St.
Fresno, Cal.	Western Auto Electric Corp.	1444 Van Ness St.
Glendale, Cal.	Western Auto Electric Corp.	
Houston, Tex.	Tel. Electric Co.	602 Preston Ave.
Indianapolis, Ind.	Manufacturers Service Co.	102 W. North St.
Jacksonville, Fla.	Magneto Exchange	231 N. Adams St.
Kansas City, Mo.	Electric Products Co.	1719 McGee St.
Knoxville, Tenn.	McNutt & Co.	813 So. Gay St.
Lincoln, Nebr.	Randall & Noll	317 S. 11th St.
Little Rock, Ark.	Brown & Holland	322-24 W. 6th St.
Los Angeles, Cal.	Western Auto Electric Corp.	440 West Pico
Louisville, Ky.	Rommel Smith Motor Co.	901 E. Broadway
Memphis, Tenn.	Donelson Auto Supply Co.	231 Monroe Ave.
Miami, Fla.	Electric Garage Co.	320-13th St.
Milwaukee, Wis.	Wisconsin Magneto Co.	528 Milwaukee St.
Minneapolis, Minn.	Reinhard Bros. Co.	14 S. 8th St.
Mobile, Ala.	Mobile Electric Garage	
Newark, N. J.	P. J. Durham Co., Inc.	235 Central Ave.
New Bedford, Mass.	Auto Electric Service Station	660 Pleasant St.
New Brunswick, N. J.	New Brunswick Stor. Battery Co.	257 George St.
New Haven, Conn.	The New Haven Electric Co.	50 Crown St.
New Orleans, La.	Coln & Suhren	901 Carondelet St.
New York City, N. Y.	P. J. Durham Co., Inc.	244 W. 49th St.
Norfolk, Va.	Reliance Electric Co.	711 Granby St.
Oakland, Cal.	Motor Electrical Specialty Co.	3963 Piedmont Ave.
Oklahoma City, Okla.	Walsh & Johnson Electric Co.	817 N. Broadway
Omaha, Nebr.	Auto Electric Service Co.	2205 Farnam St.
Pasadena, Cal.	Western Auto Electric Corp.	West Colorado St. and Pasadena Ave.
Pendleton, Ore.	Wm. E. Chase Engineering Co.	320 E. Court St.
Philadelphia, Pa.	Bright Ignition & Specialty Co.	1414 Race St.
Phoenix, Ariz.	Western Electrical Corp.	326 E. Washington St.
Pittsburgh, Pa.	P. F. Bartley Co.	Baum & Beatty Sts.
Portland, Ore.	Electric Service Auto Co.	391 Oak St.
Providence, R. I.	A. F. Maille Electric Co.	24 Garnet St.
Richmond, Va.	Electric Service Co.	721 Broad St.
Rochester, N. Y.	Starter & Ignition Service Co.	437 E. Main St.
Sacramento, Cal.	Graham & Lamus Co.	217 7th St.
Salt Lake City, Utah	Inter-Mountain Electric Co.	43 E. 4th St.
Santa Monica, Cal.	Western Auto Electric Corp.	
San Antonio, Tex.	S. X. Callahan	419 N. Flores St.
San Diego, Cal.	J. Stanley La Sha	1231-4th St.
San Francisco, Cal.	Motor Electrical Specialty Co.	1143 Post St.
Seattle, Wash.	Sunset Electric Co.	606 E. Pike St.
St. Joseph, Mo.	Electric Shop	918 Francis St.
St. Louis, Mo.	Moerschell Electric Supply Co.	2944 Locust St.
St. Paul, Minn.	Essanell Electric Co.	126 W. 6th St.
Sioux City, Iowa	Arthur Electric Service Co.	715 Pearl St.
Spokane, Wash.	Wm. E. Chase Engineering Co.	204 W. Yakima St.
Springfield, Mass.	Krohnes Service Station	57 Pecowsic Ave.
Stockton, Cal.	W. L. Maxwell	207 N. El Dorado St.
Tampa, Fla.	G. Norman Baughman Co.	Zack & Tampa Sts.
Toledo, Ohio	Electric Power Maintenance Co.	1101 Monroe St.
Topeka, Kan.	Machinists Electric Co.	108 W. 8th St.
Tucson, Ariz.	Southwest Auto Electric Co.	119 N. 6th St.
Tulsa, Okla.	Walsh & Johnson Electric Co.	919 So. Main St.
Utica, N. Y.	Stiefvater Electric Co.	412 Seneca St.
Washington, D. C.	Chas. Rubel & Co.	1621 L St., N. W.
Wichita Falls, Tex.	Electric Service Station	814 Scott Ave.
Yakima, Wash.	Wm. E. Chase Engineering Co.	204 W. Yakima St.
	CANADA	
Montreal, Que.	Fehr Bros.	172 Bleury St.
Toronto, Ont.	Auto Electric Service Sta.	78 Victoria St.
Regina, Sask.	Motor Supplies, Ltd.	1824 Cornwall St.

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TACKS, Upholstery (Continued)

Regal—See Roberts, G. G.
Ripley & Bartlett Co., Water St., Plymouth, Mass.
Roberts, G. G., South Ave., Whitman, Mass. "Crown," "Regal."
Salmond & Son, Sam, Hanover, Mass.
Shelton Co., Shelton, Conn.
Tockwotton Co., 79 S. Main St., Providence, R. I.
Tower Mfg. Co., Madison, Ind.
Turner & Seymour Mfg. Co., Torrington, Conn. "Eagle," "Leatherlike."
Waterman Co., R. C., Water St., South Hanover, Mass.

TAIL LAMP BRACKETS — See Brackets, Side and Tail Lamp

TAIL LAMPS—See Lamps, Electric Side and Tail

TAIL LIGHT INDICATORS—See Indicators, Tail Light

TALC, Tire

(Including Soapstone and Mica Tire Powders)

Arnstein, Eugene, 45 W. 26th St., Chicago, Ill. "Century."
Bestyet—See St. Louis Rubber Cement Co.
Century—See Arnstein, Eugene.
Cohutta Talc Co., Dalton, Ga.
Doggett, Stanley, 11-13 Cliff St., New York, N. Y.
Durkee-Atwood Co., Minneapolis, Minn. "Rie-Nie."
E-Fec-Tiv—See Permatite Mfg. Co.
Faultless—See Hawkeye Oil Co.
Hall-Thompson Co., Hartford, Conn. "Wonder Worker." (See page 739.)
Hawkeye Oil Co., Miles & Roosevelt Sts., Waterloo, Ia. "Faultless."
Jewell—See Wadsworth-Howland Co.
Martin-Senour Co., 2510 Quarry St., Chicago, Ill.
Mobo—See Stanley, John T.
National Cement & Rubber Co., 300-16 S. St. Clair St., Toledo, O.
Nevins Co., Samuel, 109 E. Second St., Philadelphia, Pa.
Northwestern Chemical Co., 610 State St., Marietta, O. (See page 205.)
Permatite Mfg. Co., 67 Fifth Ave., N. E., Minneapolis, Minn. "E-Fee-Tiv."
Poughkeepsie Utilities Corp., Poughkeepsie, N. Y. "Utility."
Reflex Ignition Co., 1710 Payne Ave., Cleveland, O. (See page 595.)
Richmond Mica Co., 321-23 S. Ninth St., Richmond, Va. "Rimco."
Rie-Nie—See Durkee-Atwood Co.
Rimco—See Richmond Mica Co.
St. Louis Rubber Cement Co., 3046 Lambdin Ave., St. Louis, Mo. "Bestyet."
Stanley, John T., 630 W. 30th St., New York, N. Y. "Mobo."
Steward Mfg. Co., D. M., Chattanooga, Tenn.
U. S. Mica Mfg. Co., Chicago, Ill. (See page 743.)
Utility—See Poughkeepsie Utilities Corp.
Wadsworth-Howland Co., 225 N. Carpenter St., Chicago, Ill. "Jewel."
Whittaker, W. H., 245 Front St., New York, N. Y.
Williams & Co., C. K., N. 13th St., Easton, Pa.
Wonder Worker—See Hall-Thompson Co.
Woodworth Mfg. Corp., Niagara Falls, N. Y. (See page 721.)

TANDEM ATTACHMENTS, MOTORCYCLE—See Seats, Motorcycle Tandem

TANK CAPS FOR FORDS—See Caps, Gasoline Tank

TANK EJECTORS—Eee Ejectors

TANK GAGES—See Gages, Gasoline Tank; also Gages, Vacuum Tank

TANK KEYS—See Keys, Acetylene

TANK TRUCKS — See Trucks, Oxygen Tank

TANKS, Acetylene

(For acetylene lights on car also including tanks for welding; see also Machines, Autogenous Welding)

Air Reduction Sales Co., 120 Broadway, New York, N. Y. "Airco."
Airco—See Air Reduction Sales Co.
Commerical Acetylene Supply Co., 80 Broadway, New York, N. Y.
Fireball Gas Tank & Illuminating Co., 5010 Delmar Blvd., St. Louis, Mo.
Headlight Gas Co., 2136 N. Lawrence Ave., Wichita, Kans.
International Acetylene Co., Middletown, Conn. "Meteor."
Meteor—See International Acetylene Co.
Prest-O-Lite Co., Indianapolis, Ind. (See page 89.)

TANKS, Chemical Fire

(For installation on Motor Propelled Fire Apparatus)

Ajax Fire Engine Works, Bush Terminal Bldg. No. 10, Brooklyn, N. Y.
Childs Co., O. J., 138 W. Liberty St., Utica, N. Y.
Northern Fire Apparatus Co., 2422 University Ave., S. E., Minneapolis, Minn.

TANKS, Emergency or Reserve

(For carrying a reserve supply of Gasoline or Oil; for Reserve Cocks—See Valves, Two Way Tank)

Dover Stamping & Mfg. Co., 335 Putnam Ave., Cambridge, Mass.
Vogel & Bros., Wm., 433 Kent Ave., Brooklyn, N. Y.

TANKS, FIRE—See Tanks, Chemical Fire

TANKS, Fuel and Water

A. Z. Co., 530 W. 56th St., New York, N. Y. (See page 563.)
A. B. & B. Specialty Co., 3300-02 Fond du Lac Ave., Milwaukee, Wis.
Air-Tight Steel Tank Co., Mansion St., & B. & O. R. R., Pittsburgh, Pa.
Auto Metal Co., 531 Worthington St., Springfield, Mass.
Auto Radiator Mfg. Co., 1712 S. Michigan Ave., Chicago, Ill.
Badger & Sons Co., E. B., 62-69 Pitts St., Boston, Mass.

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CONSERVE YOUR FACTORY SPACE AND MAN POWER

LET US BUILD YOUR

Fuel—Oil—Water Tanks

Our specialty is tank building—every type—every size and for every use, **promptly!**

G.P.&F. SERVICE
"KNOWING HOW SINCE '81"

We are serving at the present time a great many truck and tractor manufacturers of national prominence and know that we can make you attractive prices on uniformly satisfactory material.

Send blue prints or samples for our prices, please.

GEUDER, PAESCHKE & FREY CO., 1500-1700 St. Paul Ave., Milwaukee, Wis.

Over 15 acres of floor space

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TANKS, Fuel and Water (Cont'd)

Brummeler's Sons Co., Wm., 413 Ionia Ave., S. W., Grand Rapids, Mich. "Brusco."

Brusco—See Brummeler's Sons Co.

Bush Mfg. Co., Hartford, Conn. (See page 573.)

Chicago Mfg. Co., 1458-64 Michigan Ave., Chicago, Ill. (See page 741.)

Clayton & Lambert Mfg. Co., Detroit, Mich. (See page 743.)

Columbus Auto Brass Co., Columbus, O. (See page 395.)

Cornwall Mfg. Co., E. 128th St. & Penobscot Ave., Cleveland, O.

Detroit Auto Specialty Co., 909-11 Greenwood Ave., Detroit, Mich.

Evans Mfg. Co., First Ave. & 21st St., Moline, Ill.

Federal Pressed Steel Co., Keefe Ave. & N. Pierce St., Milwaukee, Wis.

Freeland Sons Co., B. F., Sturgis, Mich.

Geuder, Paeschke & Frey Co., 1422-1700 St. Paul Ave., Milwaukee, Wis. (See page 679.)

Hunt & Dorman Mfg. Co., 1600 E. 24th St., Cleveland, O.

Janney-Steinmetz & Co., Philadelphia, Pa. "Jasco." (See page 683.)

Jasco—See Janney-Steinmetz & Co.

Johnson's Automobile Sheet Metal Works, W. N., 620-28 South J St., Richmond, Ind.

Kells Mfg. Co., W. J., 521-25 W. 45th St., New York, N. Y. (See page 575.)

Koven & Bro., L. O., 154 Ogden St., Jersey City, N. J.

Lawco—See Lawson Co.

Lawson Co., F. H., Dept. D., Cincinnati, O. "Lawco." (See page 663.)

Long Mfg. Co., Detroit, Mich. (See page 557.)

McDole Automobile Sheet Metal Works, 218-20 E. Water St., Kalamazoo, Mich. "Maco." (See page 285.)

Maco—See McDole Automobile Sheet Metal Works.

Metal Auto Parts Co., Industrial Bldg., Indianapolis, Ind.

Michigan Stamping Co., Mack Ave. & Detroit Terminal, Detroit, Mich.

Mitchell & Son, G. F., 6501 Cedar Ave., Cleveland, O.

Motors Metal Mfg. Co., Milford Ave. & P. M. R. R., Detroit, Mich.

Murray Mfg. Co., J. W., Clay & St. Aubin. Aves., Detroit, Mich.

National Can Co., Detroit, Mich. (See page 553.)

Paragon Auto-Parts Mfg. Co., 506 W. 53d St., New York, N. Y.

Perfex Radiator Co., Racine, Wis.

Pressed Steel Tank Co., Greenfield Ave., West Allis, Wis.

Progressive Sheet Metal Co., 1976-84 Central Ave., Cincinnati, O.

Scaife & Sons Co., Wm. B., Pittsburgh, Pa. (See pages 683 and 723.)

Sheppard Mfg. Co., 1331 Jackson Blvd., Chicago, Ill.

Shotwell-Hobart-Johnson Co., 712-22 Ontario Ave., N., Minneapolis, Minn.

Todd Mfg. Co., Minneapolis, Minn. (See page 571.)

Trageser Steam Copper Works, John, 447-57 W. 26th St., New York, N. Y.

Weber Bros. Metal Works, 108-28 N. Jefferson St., Chicago, Ill.

Welded Steel Barrel Corp., Hart & Charlevoix Sts., Detroit, Mich.

Western Drop Forge Co., Marion, Ind. (See page 783.)

Western Metal Specialty Co., 1919 St. Paul Ave., Milwaukee, Wis.

Wilson & Bowen, 1318 S. Main St., Los Angeles, Cal.

Xardell Bros. Co., 28 Broadway, Utica, N. Y.

York Corrugating Co., York, Pa.

TANKS, GASOLINE AND WATER—See Tanks, Fuel

TANKS, Inner Tube Testing

(Specially formed tanks for locating leaks in tubes)

Dover Stamping & Mfg. Co., 385 Putnam Ave., Cambridge, Mass.

Haco—See Heller-Aller Co.

Heller-Aller Co., Napoleon, O. "Haco."

TANKS, RESERVE—See Tanks, Emergency

TANKS, STORAGE—See Tanks and Systems, Gasoline Storage

TANKS and SYSTEMS, Gasoline Storage

Arco—See Tokheim Mfg. Co.

Advance Pump & Tank Works, 1129-31 N. Sixth St., St. Louis, Mo.

Air-Tight Steel Tank Co., Mansion St. & B. & O. R. R., Pittsburgh, Pa.

Allen Pressure System Co., 24 W. 61st St., New York, N. Y. "Apsco."

American Oil Pump & Tank Co., Findlay & Dalton Sts., Cincinnati, O.

Apsco—See Allen Pressure System Co.

Barnes Mfg. Co., Mansfield, O.

Big Gusher—See Western Oil Pump & Tank Co.

Biggs Boiler Works Co., Bank & William Sts., Akron, O.

Bowser & Co., S. F., Fort Wayne, Ind.

Boyle-Dayton Co., 51st St. & Santa Fe Ave., Los Angeles, Cal.

Brady—See Visible Measure Gasoline Dispenser Co.

Briskin Mfg. Co., 215 S. Hoyne Ave., Chicago, Ill.

Butler Mfg. Co., 1324 Grand Ave., Kansas City, Mo.

Champion—See Cleveland Faucet Co.

Cleveland Faucet Co., 708 Frankfort Ave. N. W., Cleveland, O. "Champion."

Columbian Steel Tank Co., 1601-21 W. 12th St., Kansas City, Mo.

Dayton Pump & Mfg. Co., Fifth & Norwood Sts., Dayton, O. "Rapidayton."

Delphos Mfg. Co., 100-24 S. Pierce St., Delphos, O.

Deming Co., Salem, O.

Eastern Oil Tank Co., 146 Fletcher St., Lowell, Mass.

Freeland Sons Co., B. F., Sturgis, Mich. "Pioneer."

Freeland Steel Tank Co., Portage, Wis.

Geyser—See Visible Gasoline Dispenser Co.

Gilbert & Barker Mfg. Co., Cold Springs Ave. (W. Springfield), Springfield, Mass.

Groetken Pump Co., 171 Middle Ave., Aurora, Ill.

Guarantee Liquid Measure Co., Rochester, Pa. (See page 494.)

Haco—See Heller-Aller Co.

Harry Steel Co., O. K., 2333-35 Papin St., St. Louis, Mo.

Hawkeye—See Tokheim Mfg. Co.

Heil Co., 26th & Montana Aves., Milwaukee, Wis. "Quality."

Heller-Aller Co., Napoleon, O. "Haco."

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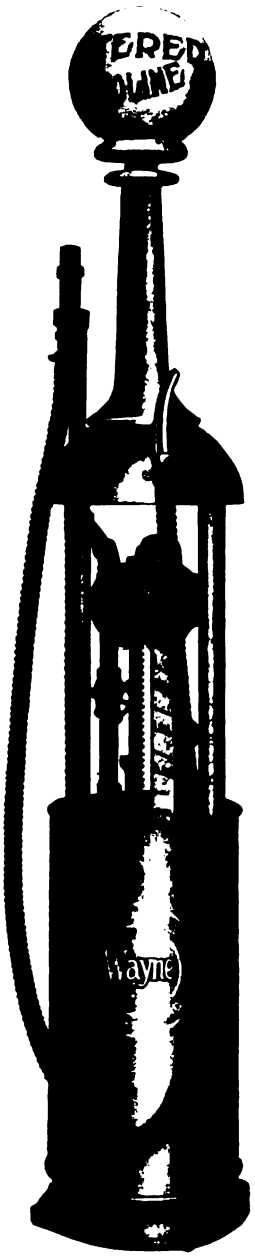
Conserve Gasoline Delivery by Installing a



Wayne

Honest Measure Pumps

No. 302 Gasoline Pump

The continuous forward stroke of the pump handle saves time, because the raising or lowering of the plunger is accomplished by one motion, without a pause between them.

Consider these points:

Double brass valves in suction line, carefully machined and hand-ground to seat. Valves set in a solid brass body. Aluminum 20-gallon discharge registered on street side, in plain view of the customer. Smaller quantities measured by exactly located quantity stops. Recording meter that registers all quantities up to 100,000 gallons and then repeats. Special filtering device that actually filters and delivers clean gasoline.

And then the patented Wayne Housing—

a circular steel section which lowers and telescopes the steel pedestal when opened, and locks tight when closed—no overhanging doors which might break off. Operates as easy as opening and closing a window.

Wayne No. 302 standing at YOUR curb is an emblem of service to the passing motorist—a sure signal of honest measure and quick delivery.

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WAYNE OIL TANK & PUMP CO. Fort Wayne, Indiana

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TANKS and SYSTEMS, Gasoline Storage (Continued)

Hull Pump & Tank Co., Indianapolis, Ind.
Hydraulic Oil System Corp., Kresge Bldg., Detroit, Mich.
Ideal—See Kupferle Bros. Mfg. Co.
Imperial—See Western Oil Pump & Tank Co.
Inglis Mfg. Co., 283 Fifth Ave., Milwaukee, Wis.
Kewanee Private Utilities Co., Kewanee, Ill.
Keystone Boiler & Foundry Co., Landisville, Pa.
Koven & Bro., L. O., 154 Ogden St., Jersey City, N. J.
Kupferle Bros. Mfg. Co., 600-04 N. Second St., St. Louis, Mo. "Ideal."
Leetonia Boiler Co., Leetonia, O.
Little Gem—See Western Oil Pump & Tank Co.
Little Sampson—See Western Oil Pump & Tank Co.
Milwaukee Tank Works, 151 Becher St., Milwaukee, Wis. (See page 703.)
Mogul—See Western Oil Pump & Tank Co.
Morrison Bros., Elm St., Dubuque, Ia.
National Store Specialty Co., Bareville, Pa. "Pennsylvania."
Neil & Co., Wm., 617 Division St., Chicago, Ill.
Niles Steel Tank Co., Niles, Mich.
Norwich Storage Tank Co., Lackawanna Ave., Norwich, N. Y.
Pennsylvania—See National Store Specialty Co.
Perfection—See Western Oil Pump & Tank Co.
Pioneer—See Freeland Sons Co.
Quality—See Heil Co.
Rapidayton—See Dayton Pump & Mfg. Co.
Rothweiler & Co., First & Hanford Sts., Seattle, Wash.
Scaife & Sons Co., Wm. B., Pittsburgh, Pa. (See pages 683 and 723.)
Stover Steel Tank & Mfg. Co., Hancock Ave., Freeport, Ill.
Taylor Mfg. Co., Montclair, N. J.
Tirrill Gas Machine Lighting Co., 103 Park Ave., New York, N. Y.
Tokheim Oil Tank & Pump Co., Fort Wayne, Ind. "Acro," "Hawkeye."
U-See Mfg. Co., 418-20 E. Scarrett St., Springfield, Ill.
Universal Iron & Supply Co., St. Louis, Mo.
Vac Liquid Equipment Co., 1125 C Ave., W., Cedar Rapids, Ia.
Visible Gasoline Dispenser Co., 422 First Ave., Pittsburgh, Pa. "Geyser." (See page 621.)
Visible Measure Gasoline Dispenser Co., 124 S. Fourth Ave., Louisville, Ky. "Brady."
Wayne Oil Tank & Pump Co., Fort Wayne, Ind. (See page 681.)
Welded Steel Barrel Corp., Hart & Charlevoix Sts., Detroit, Mich.
Western Oil Pump & Tank Co., 2437 Kosciuske St., St. Louis, Mo. "Little Sampson," "Imperial," "Perfection," "Little Gem," "Big Gusher," "Mogul."

TANKS, Oxygen

(For use in Autogenous Welding or Carbon Removing)

Air Reduction Sales Co., 120 Broadway, New York, N. Y. "Airco."
Airco—See Air Reduction Sales Co.
Burdett Oxygen Co., 1401-05 Jackson Blvd., Chicago, Ill.
Linde Air Products Co., 42d St. Bldg., New York, N. Y.
Superior Oxygen Co. of Mo., 115 Plum St., St. Louis, Mo.
Tariffville Oxygen & Chemical Co., Tariffville, Conn.
Universal Oxygen Co., 14th & Illinois Sts., Sheboygan, Wis.
Vulcan Process Co., 2450 University Ave., S. E., Minneapolis, Minn.

TANKS, RESERVE—See Tanks, Emergency

TANKS, STORAGE—See Tanks, Gasoline Storage

TANKS, Tire Inflating

(Steel tanks filled with compressed air or carbonic acid gas for carrying on car)

Bishop-Babcock-Becker Co., E. 49th St. & Hamilton Ave., Cleveland, O.
Cleveland Faucet Co., 708 Frankfort Ave., N. W., Cleveland, O.
Liquid Carbonic Co., 3100 S. Kedzie Ave., Chicago, Ill.

Tanks, Vacuum Gasoline

(For Magnetic Pumps—See Systems, Magnetic Pump)

Carter Carbureter Co., 2838-40 N. Spring Ave., St. Louis, Mo.
Sparks-Withington Co., Jackson, Mich. "Sparton."
Sparton—See Sparks-Withington Co.
Stewart-Warner Speedometer Corp., Chicago, Ill. (See page 499.)
Vac No—See Vapor Valve Co.
Vapor Valve Co., 2822 N. Spring Ave., St. Louis, Mo. "Vac No."

TANKS, WATER—See Tanks, Fuel

TAP EXTRACTORS—See Extractors, Broken Tap

TAPE, Insulating and Tire

Bestyet—See St. Louis Rubber Cement Co.
Black Diamond—See Dunton Co.
Boston Woven Hose & Rubber Co., 110 Portland St., Cambridge, Mass. "Ever-grip."
Clifton Mfg. Co., 65 Brookside Ave. (Jamaica Plain), Boston, Mass.
Dunton Co., M. W., 150-52 Niagara St., Providence, R. I. "Black Diamond."
Evergrip—See Boston Woven Hose & Rubber Co.
Goodrich Co., B. F., S. Main St., Akron, O.
Indiana Rubber & Insulated Wire Co., Jonesboro, Ind.
J-M—See Johns-Manville Co.
Johns-Manville Co., H. W., Madison Ave. & 41st St., New York, N. Y. "J-M."
Kerite Insulated Wire & Cable Co., 30 Church St., New York, N. Y.
Manson—See Okonite Co.
Multibestos—See Standard Woven Fabric Co.
New York Insulated Wire Co., 114 Liberty St., New York, N. Y.
Okonite Co., 253 Broadway, New York, N. Y. "Manson."
Russell Mfg. Co., Middletown, Conn. (See page 415.)
St. Louis Rubber Cement Co., 3046 Lambdin Ave., St. Louis, Mo. "Bestyet."
Standard Woven Fabric Co., Walpole, Mass. "Multibestos," "Stanwal." (See page 787.)
Stanwal—See Standard Woven Fabric Co.
United States Tire Co., Broadway & 58th St., New York, N. Y. (See page 695.)
Van Cleef Bros., 7709-11 Woodlawn Ave., Chicago, Ill.
Westinghouse Electric & Mfg. Co. (E. Liberty), Pittsburgh, Pa.

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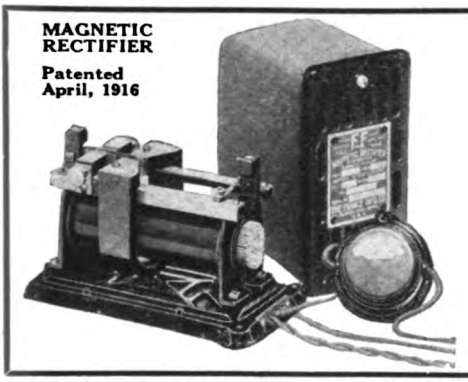

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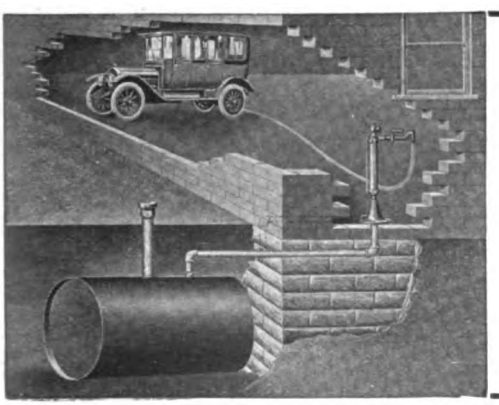

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TAPE, TIRE—See Tape, Insulating

TAPER PINS—See Pins, Taper

TAPES, Aeroplane Paper

Easimoov—See Ideal Coated Paper Co.
Ideal Coated Paper Co., Brookfield, Mass. "Easimoov."

TAPPETS, VALVE—See Rods, Adjustable Valve Lift

TAPPING DRILLS—See Drills, Upright

TAPPING MACHINES—See Machines, Tapping

TAPS, Dies and Screw Plates

Acme—See American Tap & Die Co.
Adamantine—See American Tap & Die Co.
American Tap & Die Co., Greenfield, Mass. "Adamantine," "Acme," "Eagle." (See page 685.)
Bay State Tap & Die Co., Mansfield, Mass.
Besly Co., Charles H., 118-24 N. Clinton St., Chicago, Ill.
Brubaker & Bros., W. L., Millersburg, Pa.
Butterfield & Co., Derby Line, Vt. "Derby."
Card Mfg. Co., S. W., Mansfield, Mass. "Paragon."
Carpenter Tap & Die Co., J. M., 17 Newell Ave., Pawtucket, R. I.
Champion Blower & Forge Co., Harrison Ave., Lancaster, Pa.
Conant & Donelson Co., Conway, Mass. "Reliable."
Derby—See Butterfield & Co.
Detroit Twist Drill Co., Detroit, Mich. (See page 259.)
Eagle—See American Tap & Die Co.
Geometric Tool Co., Blake & Valley Sts., New Haven, Conn.
Green River—See Greenfield Tap & Die Corp.
Greenfield Tap & Die Corp., Greenfield, Mass. "Little Giant." "Lightning," "Green River," "Hercules." (See page 687.)
Helmet—See Besly & Co.
Hercules—See Greenfield Tap & Die Corp.
Lightning—See Greenfield Tap & Die Corp.
Little Giant—See Greenfield Tap & Die Corp.
Manufacturers Equipment Co., 169 N. Jefferson St., Chicago, Ill.
Modern Tool Co., Fourth & State Sts., Erie, Pa.
Morse Twist Drill & Machine Co., New Bedford, Mass.
Oster Mfg. Co., 2102 E. 61st St., Cleveland, O.
Paragon—See Card Mfg. Co.
Pratt & Whitney Co., 111 Broadway, New York, N. Y. (See page 73.)
Reed & Prince Mfg. Co., Duncan Ave., Worcester, Mass.
Reliable—See Conant & Donelson.
Remington Tool & Machine Co., 88 Broad St., Boston, Mass.
Russell Mfg. Co., Greenfield, Mass.
Standard Tool Co., 6900-34 Central Ave., Cleveland, O.
Superior Tap Co., Charlestown, N. H.
Thistle—See Winter Bros. Co.
Toledo Tap & Die Co., Clinton St. & Oakwood Ave., Toledo, O.
Webster & Perks Tool Co., Springfield, O.
Winter Bros. Co., Kendrick St., Wrentham, Mass. "Thistle."

TAPS, Dies and Screw Plates, for Fords

Butterfield & Co., Derby Line, Vt.
Greenfield Tap & Die Corp., Greenfield, Mass. "Lightning." (See page 687.)
Lightning—See Greenfield Tap & Die Corp.
Wells & Son Co., F. E., 75 Ridell St., Greenfield, Mass.

TAR REMOVING COMPOUNDS—See Compounds, Tar Removing

TAXIMETERS

American Taximeter Co., 16 W. 61st St., New York, N. Y. "Popp," "Jones."
International Taximeter Co. of America, 239 W. 68th St., New York, N. Y.
Jones—See American Taximeter Co.
Pittsburgh Taximeter Co., Centre & Negley Aves., Pittsburgh, Pa.
Popp—See American Taximeter Co.

TEE STEEL—See Steel, Angle

TEES, PIPE—See Fittings, Pipe

TELEPHONES, Aeroplane

Aviaphone—See General Acoustic Co.
General Acoustic Co., 220 W. 42nd St., New York, N. Y. "Aviaphone."

TELEPHONES, Limousine

(For Speaking Tubes—See Tubes, Speaking; For Annunciators—See Annunciators)

American Electric Co., State & 64th Sts., Chicago, Ill. "Carphone."
Carphone—See American Electric Co.
Chau-Phone—See Western Electric Co.
General Acoustic Co., 220 W. 42d St., New York, N. Y.
Gohring—See Taylor Co.
O'Brien Mfg. Co., Joseph F., 391 Broadway, New York, N. Y.
Stentor Electric Mfg. Co., 68 Hunters Point Ave., Long Island City, N. Y. (See page 685.)
Taylor Co., H. D., 101-05 Oak St., Buffalo, N. Y. "Gohring."
Western Electric Co., 195 Broadway, New York, N. Y. "Chau-Phone."

TELL-TALES, TAIL LIGHT—See Indicators, Tail Light

TEMPERATURE CONTROLLERS FOR FORDS—See Covers or Shields, Automatic Radiator

TEMPERING FURNACES—See Furnaces, Annealing

TEMPERING, METAL—See Treating, Heat

TENONING MACHINES—See Machines, Wood Mortising

TENTS, Touring

Auto Bed Camp Mfg. Co., 1504 Grand Ave., Kansas City, Mo.
Auto Bed Co., Bellingham, Wash.
Burch Mfg. Co., F. J., Pueblo, Colo. "Pullman."
Carnie-Goudie Mfg. Co., 22d & Grand Sts., Kansas City, Mo.
Cleveland-Akron Bag Co., E. 40th St. & Perkins Ave., Cleveland, O.

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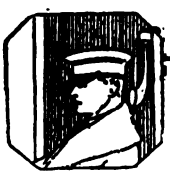

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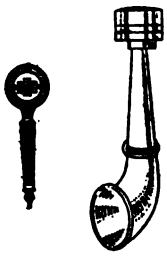

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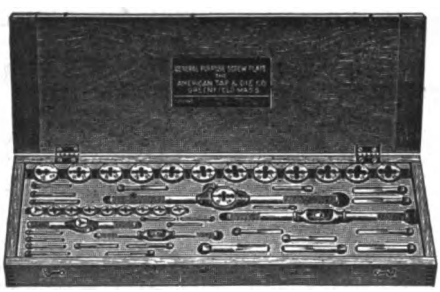

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TENTS, Touring (Continued)

Compac Tent Co., 425 W. Tenth St., Indianapolis, Ind.

Cruiser Motor Car Co., Madison, Wis. (See page 17.)

De Bretteville, Gustav, Claus Spreckles Bldg., San Francisco, Cal.

Des Moines Tent & Awning Co., 915 Walnut St., Des Moines, Ia.

Dri-Nites—See Holden Mfg. Co.

Enterprise Bed Co., Hammond, Ind.

Genesee Mfg. Co., 516-18 Harrison St., Flint, Mich.

Holden Mfg. Co., 409 N. Franklin Ave., St. Paul, Minn. "Dri-Nites."

Pullman—See Burch Mfg. Co.

Strong Bungalow Co., 226 Edgewood St., Hartford, Conn.

Tentobed Co., 3419 W. Lake St., Chicago, Ill.

Way Sagless Spring Co., E. Hennepin St. & Fifth Ave., S. E., Minneapolis, Minn.

TERMINAL CLEANING TOOLS—See Tools, Terminal Cleaning

TERMINALS, Timer, for Fords

Pedersen Lubricator Co., 636 First Ave., New York, N. Y. "United."

United—See Pedersen Lubricator Co.

TERMINALS, Wire

(See also Connectors, Battery)

Becco—See Michigan Motor Specialties Co.

Blauvelt Co., James P., Cedar St., Nyack, N. Y.

Bliss-Chester Co., Providence, R. I. "Duplex."

Braeznell, J. H., 26 Court St., Brooklyn, N. Y.

Champion Spark Plug Co., 1016 Upton Ave., Toledo, O. "J-D." (See page 509.)

Connecticut Telephone & Electric Co., Meriden, Conn. (See pages 676 and 677.)

Duplex—See Bliss-Chester Co.

E G Mfg. Co., 250 W. 54th St., New York, N. Y. (Dealers.) (See page 215.)

Elk Mfg. Co., 1926 Broadway, New York, N. Y.

Erie Metal Products Co., Erie, Pa. (See page 523.)

Eureka—See Morse, Frank W.

Everett Mfg. Co., 162-64 N. May St., Chicago, Ill.

Evergood—See Grossman Mfg. Corp.

Fahnestock Electric Co., Hunters Point, Long Island City, N. Y.

Fitzgerald Mfg. Co., Torrington, Conn. (See page 309.)

Francis-Rand Co., Erie Bldg., Cleveland, O. "Handy."

Goodson—See Graham Mfg. Co.

Graham Mfg. Co., 94 Point St., Providence, R. I. "Goodson."

Grossman Mfg. Corp., Emil, Bush Terminal Bldg. No. 20, Brooklyn, N. Y. "Evergood."

Handy—See Francis-Rand Co.

Hi-Po Waterproof Battery Corp., South Norwalk, Conn.

J-D—See Champion Spark Plug Co.

Lombardi Motor Car Co., 67-71 Minerva St., Derby, Conn.

Michigan Motor Specialties Co., 26-40 Dubois St., Detroit, Mich. "Becco."

Morse, Frank W., 289 Congress St., Boston, Mass. "Eureka." (See page 453.)

Pines Mfg. Co., 56 E. Randolph St., Chicago, Ill.

Pro-Mo-Tor, 245 W. 55th St., New York, N. Y. (See page 513.)

Rajah Auto-Supply Co., Bloomfield, N. J. (See page 511.)

Shain, Chas. D., Brooklyn, N. Y.

Sherman Mfg. Co., H. B., 12 Barney St., Battle Creek, Mich.

TEST CLIPS—See Clips, Electrical Test

TEST COCKS—See Gages, Oil

TESTERS, ACID—See Gages, Battery

TESTERS, BATTERY—See Gages, Battery; also Hydrometers

TESTERS, ELECTRICAL—See Instruments, Electrical

TESTERS, GASOLINE—See Hydrometers

TESTERS, GEAR—See Instruments, Gear Testing

TESTERS, METAL—See Instruments, Metal Testing

TESTERS, RUBBER—See Instruments, Rubber Testing

TESTING BUSHINGS—See Bushings, Spark Plug Testing

TESTING DYNAMOMETERS—See Dynamoters, Electric Testing

TESTING HYDROMETERS—See Hydrometers, Testing

TESTING INSTRUMENTS, ELECTRICAL CIRCUIT—See Instruments, Electrical Circuit Testing

TESTING INSTRUMENTS, GEAR—See Instruments, Gear Testing

TESTING INSTRUMENTS, METAL—See Instruments, Metal Testing

TESTING INSTRUMENTS, RUBBER—See Instruments, Rubber and Felt Testing

TESTING MACHINES, SPRING—See Machines, Spring Testing

TESTING TANKS—See Tanks, Inner Tube Testing

THERMOMETERS—See Meters, Heat Indicating

THERMOMETERS, Aircraft

Foxboro Co., 50 Church St., New York, N. Y.

National Gauge & Mfg. Co., 51 E. 42d St., New York, N. Y.

THERMOMETERS, RADIATOR—See Meters, Heat Indicating

THERMOMETERS, Vulcanizer

Genco—See General Scientific Equipment Co.

General Scientific Equipment Co., Drexel Bldg., Philadelphia, Pa. "Genco."

Queen-Gray Co., 616-18 Chestnut St., Philadelphia, Pa.

Standard Thermometer Co., 65 Shirley St, Boston, Mass. (See page 541.)

Taylor Instrument Cos., 95 Ames St., Rochester, N. Y.

Weinhagen, H., 159-65 Leonard St., New York, N. Y.

Wilson & Wilson (Waverly Sta.), Boston, Mass.

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THERMOSTATIC CARBURETOR REGULATORS FOR FORDS—See Regulators, Thermostatic Carburetor

THERMOSTATS, WATER CIRCULATION REGULATING—See Regulators, Water Circulating

THIMBLES and FERRULES, Aeroplane Wire

Barcalo Mfg. Co., 225 Louisiana St., Buffalo, N. Y.
Roeblings Sons Co., John A., S. Broad & Canal Sts., Trenton, N. J.

THREAD CUTTING COMPOUNDS—See Lubricants, Cutting

THREAD, Top and Upholstery

American Thread Co., 260 W. Broadway, New York, N. Y.
Columbia—See Meyer & Co.
Crescent—See Meyer & Co.
Hub—See Meyer & Co.
Meyer & Co., John C., Lowell, Mass. "Hub," "Crescent," "Columbia," "Rugby."
Rugby—See Meyer & Co.
Summit Thread Co., Summit St., East Hampton, Conn.

THREAD, UPHOLSTERY—See Thread, Tip

THREADING TOOLS—See Tools, Threading

THROTTLE LEVER GRIPS—See Grips, Spark and Throttle Lever

THROTTLE LEVER LOCKS—See Locks, Spark and Throttle Lever

THROTTLE VALVES—See Valves, Steam Throttle

THRUST BEARINGS FOR FORDS—See Bearings, Drive Gear Ball Thrust

THUMB NUTS—See Nuts, Thumb

THUMB SCREWS—See Screws, Thumb

TIE RODS, AEROPLANE—See Rods, Aeroplane, Tie

TIGHTENERS, STUD BOLT—See Extractors, Stud Bolt

TIGHTENERS, Tire Chain

Harp Auto Chain Tightener Co., Galax, Va.
Merchant Corp., M. H., 2720 Midland Ave., Syracuse, N. Y. (See page 725.)

TIGHTENING COMPOUNDS—See Compounds, Wood Wheel Tightening

TILTING BODIES—See Bodies, Special Dumping

TILTING WHEEL ATTACHMENTS FOR FORDS—See Attachments, Tilting Wheel

TIME CHECKS—See Checks, Brass, Time, Tool and Pay

TIME RECORDERS—See Registers, Autographic and Manifold

TIME RECORDING CLOCKS—See Clocks, Time Recording

TIME STAMPS—See Stamps, Time

TIMER CAPS FOR FORDS—See Caps, Timer

TIMER ELEVATING ATTACHMENTS FOR FORDS—See Brackets, Timer Elevating

TIMER ELEVATING BRACKETS FOR FORDS—See Brackets, Timer Elevating

TIMERS, Ignition or Spark

(See also Systems, Single Spark Ignition)

Almy Water Tube Boiler Co., ft. Rhoades St., Providence, R. I.
Ampco—See S-M Novelty Mfg. Co.
Benford Mfg. Co., Box H., Mt. Vernon, N. Y. "Monarch." (See page 517.)
Capitol Tool & Die Works, 1100 Oakdale Ave., Chicago, Ill. "Star."
Connecticut Telephone & Electric Co., Meriden, Conn. (See pages 676 and 677.)
Cuno Engineering Corp., 80 S. Vine St., Meriden, Conn.
Heco—See Heinze Electric Co.
Heinze Electric Co., Lowell, Mass. "Heco."
Inter-State Machine Products Co., 56 Allen St., Rochester, N. Y. "Leavitt," "Uncas."
Klahn—See Mosler & Co.
Leavitt—See Inter-State Machine Co.
Long Bros., Broadway & Buckeye St., Kokomo, Ind.
Lundgren Mfg. Co., Hale Bldg., Philadelphia, Pa.
Milwaukee Auto Engine & Supply Co.—See Zinke Co.
Monarch—See Benford Mfg. Co.
Mosler & Co., A. R., Mt. Vernon, N. Y. "Klahn," "Umph."
New York Coil Co., 338-40 Pearl St., New York, N. Y. "Rhoades."
Pro-Mo-Tor, 245 W. 55th St., New York, N. Y. (See page 513.)
Rhoades—See New York Coil Co.
S-M Novelty Mfg. Co., 52d St. & Baltimore Ave., Philadelphia, Pa. "Ampco."
Sintz—See Wilmarth & Morman Co.
Splitdorf Electrical Co., Newark, N. J.
Star—See Capitol Tool & Die Works.
Umph—See Mosler & Co.
Uncas—See Inter-State Machine Co.
Wells Mfg. Co., R. C., Fond du Lac, Wis.
Wilmarth & Morman Co., 1179 Monroe Ave., N. W., Grand Rapids, Mich. "Sintz."
Zinke Co., 1323-25 Michigan Ave., Chicago, Ill. (Sole Distributors for Milwaukee Auto Engine & Supply Co., Milwaukee, Wis.)

TIMERS, Ignition or Spark, for Fords

(See also Systems, Single Spark)

American Automobile Accessories, 1121 N. Crawford Ave., Chicago, Ill "Shortless."
Apco Mfg. Co., Eddy St., Providence, R. I.
Bemus—See Motor Specialties Co.
Benford Mfg. Co., Box H, Mt. Vernon, N. Y. "Monarch." (See page 517.)
Brown Co., 213 Bellevue Ave., Syracuse, N. Y.

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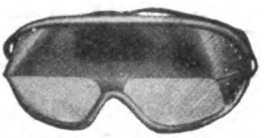
Furnished in white or imitation shell frame with 1/10 12k gold-filled center-piece. Temples are covered with yellow tubing.

Style No.
121. Fitted with 44 mm. amber lenses. Per dozen $18.00
122. Fitted with 47 mm. amber lenses. Per dozen $19.80
123. Fitted with 51 mm. amber lenses. Per dozen $21.00

TWO-COLORED DIMMER GOGGLES



A combination eye shade and goggle, giving protection from the sun from above, and from headlights when the head is slightly lowered.

Description	Regular Size No.	Large Size No.
Clear, with green shade	1-C-G.D.	2-C-G.D
Light amber with green shade	1-A-G.D.	2-A-G.D
Dark amber with green shade	1-O-G.D.	2-O-G.D
Clear with orange shade	1-C-O.D.	2-C-O.D.
Light amber with orange shade ..	1-A-O.D.	2-A-O.D.

Rubber binding will be furnished unless chenille is specified.
No. 1. Regular size goggle. Each $0.75
No. 2. Large size goggle. Each 1.00
Imitation leather case for either size ..... .25

THE CESCO GOGGLE

For sportsmen, trap shooters or motorists.
The most notable feature is what is generally known as a "Flexible Connection." This consists of joining the lenses with a center-piece which bends forward or backward, and returns the lenses to their relative position.
This lessens the pressure on the nose, and prevents pressure behind the ears.
Can be worn over other glasses.
The bridge is made of 1/10 12k gold-filled spring stock; temples and ends are covered with fibre tubing.
Cesco lenses are coquille shape, in amber and fieuzal colors. Packed in metal case with spring back.
No. 139. Price, per dozen.....$24.00

DIMMER GOGGLES

Style "A"

Style "AC"

Style "B"

Style "BC"

With a strong elastic head band. Style "A," one color, is furnished in clear, light amber or orange pyralin, and the two-color "AC" has the dimmer strip of green or orange.
Style "A," One Color, dozen....$1.50
Style "AC," Two Color, dozen.. 2.50
Specify color when ordering.

Styles "B" and "BC" have the double-end fold, and are extra-full formed. They are recommended to those who wear large spectacles.
Bound with silk chenille, adjustable rubber head bands, with special fastener.
Style "B," One Color, dozen.... $3.50
Style "BC," Two Color, dozen.. 4.50
Specify color when ordering.

THE FOLDING DIMMER GOGGLE

Full convex formed when open and flat and compact when folded. Made of transparent flexible pyralin. Sold only with strong, compact pocket-carrying case, as shown.
Style F.D. Clear or amber lower portion, with green upper portion. Dozen $5.00
Style F. Clear or amber without dimmer. Dozen $4.00

THE "MACY" FOR AVIATORS

Fitted with a combination DIMMER and RAIN SHIELD, which prevents the goggle from becoming blurred. Made of extra heavy stock to prevent warping from the extreme atmospheric pressure due to speed of flyers.

No. 141. Price, dozen.....$6.00

KILGLARE CIRCLES

Made of colored celluloid, 5 and 6½" in diameter, and are fitted with rubber suction cups by which they are attached to wind-shields.
Price, dozen, 5".....$2.00
Price, dozen, 6½"..... 3.00

CHICAGO EYE SHIELD CO., Chicago, Illinois

Order from Your Jobber. *Ask for the Sure Salesman Counter Display.*

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TIMERS, Ignition or Spark, for Fords (Continued)

C. & B.—See Ferro, M. C.

Connecticut Telephone & Electric Co., Meriden, Conn. (See pages 676 and 677.)

Cuno Engineering Corp., 80 S. Vine St., Meriden, Conn.

Detroit—See General Appliance Co.

Ferro, M. C., 2011 Michigan Ave., Chicago, Ill. "C. & B." (See page 489.)

General Appliance Co., 19th St. & Western Ave., Chicago, Ill. "Detroit."

Goodrich-Lenhart Mfg. Co., 429 Widener Bldg., Philadelphia, Pa. (See page 111.)

Herz—See Pro-Mo-Tor.

Holmes, George L., 1733 Broadway, New York, N. Y. (Eastern Distributor for Cuno Timers.) (See page 383.)

Hyway—See Staff & Eckhouse.

J. & B. Mfg. Co., Pittsfield, Mass.

Long Bros., Broadway & Buckeye St., Kokomo, Ind.

Milwaukee Auto Engine & Supply Co.—See Zinke Co.

Monarch—See Benford Mfg. Co.

Motor Specialties Co., Pine St., Waltham, Mass. "Bemus."

Nead—See Tisch Auto Supply Co.

Pro-Mo-Tor, 245 W. 55th St., New York, N. Y. "Herz." (See page 513.)

Redmond—See Riverside Specialty Co.

Riverside Specialty Co., Riverside, Cal. "Redmond."

S. A. Machine Co., Detroit, Mich. (See page 429.)

Service Mfg. Co., 211-13 Center St., New York, N. Y. (See page 529.)

Shortless—See American Automobile Accessories.

Staff & Eckhouse, 1432 S. Michigan Ave., Chicago, Ill. "Hyway." (See page 529.)

Tisch Auto Supply Co., 215 Division Ave., S. Grand Rapids, Mich. "Nead."

Wetherholt Co., 20 E. Jackson Bldg., Chicago, Ill. "Wetco."

Wetco—See Wetherholt Co.

Zinke Co., 1323-25 Michigan Ave., Chicago, Ill. (Sole Distributors for Milwaukee Auto Engine & Supply Co., Milwaukee, Wis.)

TIMERS, Motor Boat

Barber Bros., 500 E. Water St., Syracuse, N. Y.

Bemus—See Motor Specialties Co.

Herz—See Pro-Mo-Tor.

Long Bros., Broadway & Buckeye St., Kokomo, Ind.

Milwaukee Auto Engine & Supply Co.—See Zinke Co.

Motor Specialties Co., Pine St., Waltham, Mass. "Bemus."

Pro-Mo-Tor, 245 W. 55th St., New York, N. Y. "Herz." (See page 513.)

Zinke Co., 1323-25 Michigan Ave., Chicago, Ill. (Sole distributors for Milwaukee Auto Engine & Supply Co., Milwaukee, Wis.)

TIMERS, Tractor

Milwaukee Auto Engine & Supply Co.—See Zinke Co.

Zinke Co., 1323-25 Michigan Ave., Chicago, Ill. (Sole Distributors for Milwaukee Auto Engine & Supply Co., Milwaukee, Wis.)

TIPS, BURNER—See Burners, Acetylene

TIRE ALARMS—See Alarms, Tire

TIRE BANDAGE WRAPPING MACHINES—See Machines, Tire Bandage Wrapping

TIRE BANDS—See Bands, Non-Skid; also Sleeves, Tire Repair

TIRE BOLTS—See Bolts, Stove

TIRE CARRIERS—See Holders, Tire

TIRE CASES—See Covers, Spare Tire

TIRE CEMENT—See Cement, Tire Repair

TIRE CHAIN FASTENERS—See Fasteners, Tire Chain

TIRE CHAIN REPAIR LINKS—See Links, Tire Chain Repair

TIRE CHAIN SPRINGS—See Tighteners, Tire Chain

TIRE CHAIN TIGHTENERS—See Tighteners, Tire Chain

TIRE CHAIN TOOLS—See Tools, Tire Chain Repair

TIRE CHAINS—See Chains or Grips, Non-Skid

TIRE CHANGERS—See Machines, Tire Removing and Replacing

TIRE CORES—See Molds, Tire Vulcanizing

TIRE COVERS—See Covers, Spare Tire

TIRE CURING BAGS—See Bags, Steam Tire Curing

TIRE DEFLATING TOOLS—See Tools, Tire Deflating

TIRE FABRICS—See Fabric, Cotton Tire

TIRE FILLERS—See Compounds, Tire Filling

TIRE FILLING COMPOUNDS—See Compounds, Tire Filling

TIRE GAGES—See Gages, Tire

TIRE HOLDERS—See Holders, Spare Tire

TIRE INFLATERS—See Pumps; also Tanks

TIRE INFLATING TANKS—See Tanks, Tire Inflating

TIRE IRONS—See Tools, Tire

TIRE KITS—See Kits, Tire Repair

TIRE KNIVES—See Knives, Tire Repair

TIRE LOCKS—See Holders, Tire

TIRE LUGS—See Lugs, Tire

TIRE MASTICS—See Compounds, Tire Repair

TIRE MICA—See Talc, Tire

TIRE MOLDS—See Molds, Tire Vulcanizing

TIRE PAINTS—See Paints, Rubber

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Electrical Service *for the* Trade

Send your Starting, Lighting and Ignition work to us.

Our plant is fully equipped to handle all kinds of automobile and motor truck electrical repairing.

We specialize in armature rewinding and electrical machinery.

Official representatives for:

Exide Batteries General Electric Tungsten Rect.
U. S. L. Starting and Lighting Systems

MOTOR CAR SERVICE COMPANY
524-28 East 35th Street Chicago, Ill.

Are You *Conserving Light or Recklessly Wasting It?*

Do you want to turn all your lights off when you park your car? If so, get one of our "PARKINLITES!" Burns a two candle power bulb. Serves the purpose of headlights and tail light, using only 1/26 the current originally required of the battery. Parkinlite fits on left rear fender and throws a white light ahead, a red light in rear and green light at side. Can be attached in a few minutes without special tools. This light is also a safety device outlining the side of your car, so that an approaching automobile can pass with safety in face of your glaring headlights. *Dealers write for territory and descriptive literature.*

National Supply Corporation, Mfrs., Milwaukee, Wisconsin

SPEED THE WAR ORDERS!

Rapid, dependable drying apparatus, with or without automatic conveyors for motor trucks and cars, wagon parts, airplane fuselages and propellers, hand grenades, fragmentation cones, ammunition boxes and other win-the-war products.

DRYING SYSTEMS, Inc.
322 North Michigan Ave., CHICAGO, ILL.

Coppock Kerosene System

We guarantee to give you 25 miles on one gallon of Kerosene.

The saving in fuel cost is unbelievable.

Our System uses Gasoline as well as Kerosene. We guarantee to save you 75 per cent in Gasoline. A trial will convince the most skeptical.

The COPPOCK KEROSENE SYSTEM is made of Aluminum and only weighs Four Pounds.

Special inducements to live representatives

Write today for full information and price.

COPPOCK-STUBBS COMPANY
419 N. Capitol Avenue INDIANAPOLIS, IND.

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TIRE PATCHES—See Patches, Tire

TIRE PLASTICS—See Compounds, Tire Repair

TIRE PLUGS—See Plugs, Tire

TIRE POWDER—See Talc, Tire

TIRE PRESERVING COMPOUNDS—See Compounds, Tire Preserving

TIRE PRESSES—See Presses, Tire

TIRE PRESSURE GAGES—See Gages, Tire Pressure

TIRE PROTECTORS—See Treads, Tire

TIRE PUMP CONNECTION WASHERS—See Washers, Tire Pump Connection

TIRE PUMP CONNECTIONS—See Connections, Tire

TIRE PUMPS—See Pumps

TIRE PUMPS, MOTORCYCLE — See Pumps, Motorcycle Tire

TIRE PUTTY—See Compounds, Tire Repair

TIRE RACKS—See Racks, Metal Tool, Stock and Tire

TIRE REMOVING MACHINES—See Machines, Tire Removing and Replacing

TIRE REPAIR CEMENT—See Cement, Tire Repair

TIRE REPAIR COMPOUNDS—See Compounds, Tire Repair

TIRE REPAIR KITS—See Kits, Tire Repair

TIRE REPAIR KNIVES—See Knives, Tire Repair

TIRE REPAIR PLIERS—See Pliers, Tire Repair

TIRE REPLACING MACHINES—See Machines, Tire Removing and Replacing

TIRE SAVING JACKS—See Jacks, Tire Saving

TIRE SLEEVES—See Sleeves, Tire

TIRE STITCHERS—See Machines, Double Tread Tire Stitching

TIRE STITCHING MACHINES—See Machines, Double Tread Tire Stitching

TIRE STRAPS—See Straps, Leather

TIRE TALC—See Talc, Tire

TIRE TANKS—See Tanks, Tire Inflating

TIRE TAPE—See Tape, Insulating and Tire

TIRE TOOLS—See Tools, Tire; also Tools, Tire Valve Rethreading

TIRE TREADS—See Treads, Tire

TIRE VALVE TOOLS—See Tools, Tire Valve Rethreading

TIRE VALVES—See Valves, Tire

TIRE VULCANIZERS—See Vulcanizers

TIRE WRAPPING MACHINES—See Machines, Tire Bandage

TIRES, Aeroplane

Goodrich Co., B. F., S. Main St., Akron, O.

Goodyear Tire & Rubber Co., Akron, O. (See page 861.)

Usco—See United States Tire Co.

United States Tire Co., Broadway & 58th St., New York, N. Y. "Usco." (See page 695.)

TIRES, CUSHION—See Tires, Special

TIRES, Flanged Steel

(For adapting automobiles to run on railroad tracks)

Goodman Co., Herrin, Ill.

TIRES, Leather

(For Leather Treads—See Treads, Detachable)

Horseshoe—See Racine Auto Tire Co.

Racine Auto Tire Co., State St., Racine, Wis. "Horseshoe."

TIRES, Motorcycle

Firestone Tire & Rubber Co., Miller & Sweitzer Aves., Akron, O.

Goodrich Co., B. F., S. Main St., Akron, O.

Goodyear Tire & Rubber Co., Akron, O. (See page 861.)

United States Tire Co., Broadway & 58th St., New York, N. Y. "Usco." (See page 695.)

Usco—See United States Tire Co.

TIRES, Pneumatic

(See also Tubes, Inner)

Acme Rubber Mfg. Co., E. State St., Trenton, N. J.

Advance Rubber Co., 18th St. & Eighth Ave., Brooklyn, N. Y.

Ajax Rubber Co., 1796-98 Broadway, New York, N. Y.

Akron Biltwell Tire & Rubber Co., Ohio Bldg., Akron, O. (See page 863.)

Amazon Rubber Co., E. Market St., Akron, O.

American—See Mansfield Tire & Rubber Co.

American Rubber Corp., 1974 Broadway, New York, N. Y. "Arrow."

American Rubber & Tire Co., 100 Beach St., Akron, O.

Angola Tire & Rubber Co., 302 Main St., Buffalo, N. Y.

Arabian—See Defiance Tire Factories.

Archer Cord Tire & Rubber Co., 711-17 15th Ave., N. E., Minneapolis, Minn.

Arrow—See American Rubber Corp.

Auto Tire Sales Co., 1346-48 Michigan Ave., Chicago, Ill. "Lyon." (See page 773.)

Autocrat—See National Rubber Co.

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Quality is Economy

This is the Sign of a Hood Dealer

The Sign of Quality that is creating demand

Hood Tires are nationally advertised Tires. Their greatest advertising comes from the men who use them. A Hood Dealer has, therefore, two valuable assets,—an advertised and recommended tire and a tire that always means repeat orders.

Dealers who know the high quality of Hood Tires do not feel it is policy to substitute when a customer asks for Hood Tires.

In order that dealers can obtain overnight delivery anywhere, when they are asked for Hood Tires, we have placed, for convenience, a list of Hood Tire distributors on the reverse side of this page.

Call up or write and any concern listed will give you immediate service.

HOOD TIRE CO., INC.
Watertown, Mass.

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ALABAMA

Birmingham.....Newell Auto Company

ARIZONA

Los Angeles, Cal.....Hood Tire Co., Inc.

ARKANSAS

Little Rock.....Norton Berger Shoe Co.

CALIFORNIA

Fresno.....Eliot E. Bradley
Los Angeles.....Hood Tire Co., Inc.
San Diego.....San Diego Oil Stations
Los Angeles.....Eimers Brothers
Redlands.....Home Oil Co.
Santa Ana.....Matthews & Pennock
Santa Paula.....Montgomery & Dickenson
San Bernardino.....Shan's Service Station

COLORADO

Denver.....Joseph P. Dunn Tire Co.

CONNECTICUT

Norwalk.....Robert S. Gregory
Hartford-New Britain.....Alling Rubber Co.
Waterbury-Danbury.....Alling Rubber Co.
Bridgeport-Meriden.....Alling Rubber Co.
Willimantic.....L. A. Barnes
New London.....Thompson Motor Car Co.
Putnam.....Childs Lumber Corp.
Ansonia.....Ansonia Garage

DELAWARE

Philadelphia, Pa.....The Powers Co.
Baltimore, Md.....Southern Tire Repair Works

FLORIDA

Jacksonville.....Joseph H. Walsh Co., Inc.

GEORGIA

Atlanta.....John K. Gewinner, Inc.
Atlanta.....Hood Tire Co., Inc.
Savannah.....Tippens Tire Repair Co.
Macon.....Macon Auto Co.
Cordele.....Watt Holmes Hardware Co.
Atlanta.....King Hardware Co.
Bremen.....Bartlett Hdwe. Co.

IDAHO

Salt Lake City, Utah.....Pingree Brothers Co.

ILLINOIS

Chicago.....Hood Tire Co., Inc.
Joliet.....Hill Service System
Aurora.....Auto Supply & Accessories Co., Inc.
Kankakee.....E. J. La Beau
St. Louis, Mo..Geller Ward & Hasner Hdwe. Co.
Dixon.....Money Back Tire Shop No. 4
Peoria.....Graham Seltzer Co.

INDIANA

Chicago, Ill.....Hood Tire Co., Inc.
Indianapolis.....Hood Tire Co., Inc.
Terre Haute.....The Powers Supply Co.

IOWA

Des Moines.....Des Moines Tent & Awning Co.
Dubuque.....Byrne Bros. & Co.
Davenport.....Iowa Rubber Shoe Co.

KANSAS

Kansas City, Mo.....Hood Tire Co., Inc.
Wichita.....Peru Van Zandt Implement Co.
Hutchinson.....Peru Van Zandt Implement Co.

KENTUCKY

Cincinnati, O.....Mann & Longini Shoe Co.
Nashville, Tenn..B. A. Bennie Tire & Rubber Co.
Louisville.....Falls City Vulcanizing Co.

LOUISIANA

New Orleans.....National Rubber Works
Shreveport.....Crawford, Jenkins & Booth, Ltd.
Plauemine.....Iberville Wholesale Grocery Co.

MAINE

Bangor.....Bangor Vulcanizing Co.
Portland.....The Portland Co.
Houlton.....Almon H. Fogg
Bath.....Shaw Auto Co., Inc.
Saco.....J. P. Suhr

MARYLAND

Baltimore.....Southern Tire Repair Works
Hagerstown.....Domenci Hdwe. Co.

MICHIGAN

Detroit.....Hood Tire Co., Inc.
Flint.....Boomhower Auto Supply Co.
Bay City.....Bay City Auto Equipment Co.
Port Huron.....Paige Overland Co.
Pontiac.....Northern Auto Supply Co.
Lansing.....Michigan Rubber Repair Co.
Jackson.....Smith-Winchester Co.
Battle Creek.....Bock-Walker Co.
Saginaw.....Valley Tire Repair Co.

MASSACHUSETTS

Worcester.....Mechanic Motor Specialty Co.
Springfield.....George A. Tuckey
Watertown.....Hood Tire Co., Inc.
Turners Falls.....F. I. Webster Co.

MINNESOTA

Minneapolis.....Pioneer Rubber Shoe Co.

MISSISSIPPI

Meridian.....Bostick Auto & Supply Co.
Corinth.....W. R. Denton

MISSOURI

St. Joseph.....Auto Torium Accessory Co.
Kansas City.....Hood Tire Co., Inc.
St. Louis...Geller, Ward & Hasner Hardware Co.
Joplin.....Independent Rubber Co.

NEBRASKA

Lincoln.....Henkle & Joyce Hardware Co.
Omaha.....McIntyre-Haywood Motor Co., Inc.

NEVADA

Los Angeles, Cal.....Hood Tire Co., Inc.

NEW HAMPSHIRE

Manchester.....Hall Brothers Llewellyn Co.
Nashua.....Pollard Auto Co.
Concord.....Hall Brothers Garage

NEW JERSEY

Jersey City.....Tire Service & Supply Co.
Philadelphia, Pa.....The Powers Co.
Newark.....Hood Tire Co., Inc.

NEW MEXICO

Denver, Col.....Joseph P. Dunn Tire Co.

NEW YORK

New York City.....Hood Tire Co., Inc.
Syracuse.....Velvet Oil Co.
Buffalo.....Hood Tire Co., Inc.
Rochester.....Quality Tire Co.
Watertown.....Alling Rubber Co.
Utica.....Utica Tire Exchange
Burlington, Vt.....Vermont Hardware Co.
Elmira.....La France Garage

NORTH DAKOTA

Minneapolis, Minn.....Pioneer Rubber Shoe Co.

OHIO

Cleveland.....Hood Tire Co., Inc.
Cincinnati.....Mann & Longini Shoe Co.
Columbus.....H. C. Slabaugh's Son

OKLAHOMA

Clinton..Carroll, Brough, Robinson & Humphrey
Wichita, Kan....Peru Van Zandt Implement Co.

OREGON

Los Angeles, Cal.....Hood Tire Co., Inc.

PENNSYLVANIA

Erie.....Moline & Freeburg
Philadelphia.....The Powers Co.
Reading.....W. F. Price & Son
Pottsville.....Pottsville Supply Co.
Lancaster.....Sprecher & Ganss

RHODE ISLAND

Providence.....Providence Auto Equipment Co.

SOUTH CAROLINA

Spartanburg.....Spartan Hardware Co.

SOUTH DAKOTA

Minneapolis, Minn.....Pioneer Rubber Shoe Co.

TENNESSEE

Chattanooga.....Hart's Garage
Jackson.....J. H. Johnson & Son
Nashville.....B. A. Bennie Tire & Rubber Co.
Knoxville.....W. N. Briscoe Tire & Supply Co.
Memphis.....Union Motor Car Co.

TEXAS

Dallas.....Hood Tire Co., Inc.
San Antonio.....Auto Owners Supply Co.
Fort Worth.....Renfro-Funkhauser Rubber Co.

UTAH

Salt Lake City.....Pingree Brothers Co.

VERMONT

Burlington.....Vermont Hardware Co.

VIRGINIA

Richmond.....Dennis Auto Supply Co.
Washington, D. C.....Hood Tire Co., Inc.
Lynchburg.....Apperson-Lee Motor Co.
Norfolk.....Atlantic Tire & Rubber Co.
Petersburg.....City Point Motor Co.

WASHINGTON

Seattle.....West Coast Rubber Co.

WISCONSIN

Madison.....Lee Robinson
Milwaukee.....Schueler Brothers

WYOMING

Denver, Col.....Joseph P. Dunn Tire Co.

DISTRICT OF COLUMBIA

Washington.....Hood Tire Co., Inc.

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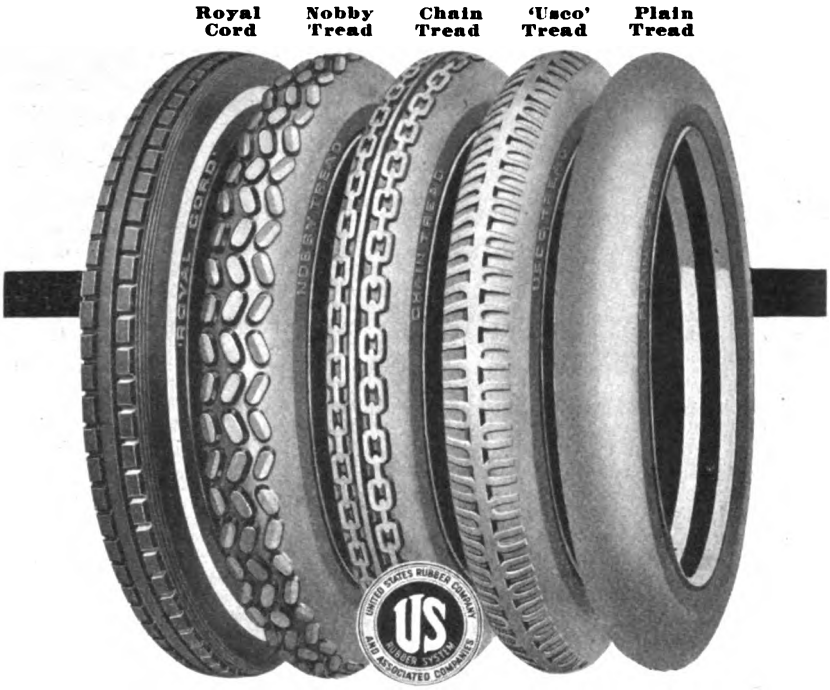

United States Tires
Are Good Tires

BRANCHES

ALBANY, N. Y., 334 Broadway.
ALLENTOWN, PA., 122 North 7th St.
AMARILLO, TEX., 409 Taylor St.
ATLANTA, GA., 495 Peachtree St.
BALTIMORE, MD., 1102 Cathedral St.
BANGOR, ME., 112 Harlow St.
BIRMINGHAM, ALA., 423 South 20th St.
BOSTON, MASS., 560 Commonwealth Ave.
BROOKLYN, N. Y., 1418 Bedford Ave.
BUFFALO, N. Y., 379 Washington St.
BUTTE, MONT., 443 East Park St.
CANTON, OHIO, 204 Third St.
CEDAR RAPIDS, IOWA, 117 Second Ave., E.
CHARLOTTE, N. C., 334 North Tryon St.
CHICAGO, ILL., 1222 Michigan Ave.
CINCINNATI, OHIO, 1121 Race St.
CLEVELAND, OHIO, 1908 Euclid Ave.
COLUMBIA, S. C., 1120 Lady St
COLUMBUS, OHIO, 86 N. Fourth St.
DAVENPORT, IOWA, 3rd and Perry Sts.
DALLAS, TEXAS, 1300-2 Jackson St.
DAYTON, OHIO, 121 South Ludlow St.
DES MOINES, IOWA, 1005 Locust St.
DETROIT, MICH., 245 Jefferson Ave., E.
DULUTH, MINN., 418 East Superior St.
EVANSVILLE, IND., 310 Upper Third St.
FARGO, N. D., 622 Second Ave., N.
FORT WAYNE, IND., 914-916 S. Harrison St.
FRESNO, CAL., 1257 K St.
GRAND RAPIDS, MICH., 17 Library St.
GREAT FALLS, MONT., 2nd Ave. S. and 2nd St.
HARTFORD, CONN., 121 Allyn St.
HARRISBURG, PA. 1010 N. Third St.
HUTCHINSON, KAN., 21 Sherman St.
INDIANAPOLIS, IND., 527-529 N. Capitol Ave.
JACKSON, MISS., 113-115 Roach St.
JACKSONVILLE, FLA., 804 Main St.
KANSAS CITY, MO., 1612-14 McGee St.
KNOXVILLE, TENN., 411 West Clinch St.
LIMA, OHIO, 124 West North St.
LOS ANGELES, CAL., 923-925 Los Angeles St.
LYNN, MASS., 1[illegible] St.
MANCHESTER, N. H., 1134 Elm St.
MILWAUKEE, WIS., 454 Milwaukee St.
MINNEAPOLIS, MINN., 1522-24 Hennepin Ave.
NEWARK, N. J., 276 Halsey St.
NEW BEDFORD, MASS., 92 N. 2nd St.
NEW HAVEN, CONN. 238 George St.
NEW ORLEANS, LA., 714 St. Charles St.
NEW YORK CITY, N. Y., Broadway at 58th St.
OKLAHOMA CITY, OKLA. 508 North Broadway.
OAKLAND, CAL., 2812 Broadway.
OMAHA, NEB., 1606 Harney St.
PEORIA, ILL., 828 Main St.
PHILADELPHIA, PA., 329-331 N. Broad St.
PHOENIX, ARIZ., 519 N. Central Ave.
PITTSBURGH, PA., 110 Seventh St.
PORTLAND, ME., 16 Forest Ave.
PORTLAND, ORE., 24-26 Fifth St. North.
PROVIDENCE, R. I., 18 Snow St.
QUINCY, ILL., 224 N. Sixth St.
RALEIGH, N. C., 316 Wilmington St.
READING, PA., 48 North Eighth St.
RICHMOND, VA., 709 W. Broad St.
ROCHESTER, N. Y., 24 Exchange St.
SACRAMENTO, CAL., 814 L St.
SALINA, KAN., 145 North 7th St.
SALT LAKE CITY, UTAH, 350 S. State St.
SAN FRANCISCO, CAL., 50 Fremont St.
SAN DIEGO, CAL., 1055 Second St.
ST. LOUIS, MO., 3149 Locust St.
SEATTLE, WASH., 212-216 Jackson St.
SIOUX CITY, IOWA, 518 Nebraska St.
SOUTH BEND, IND., 130 E. Jefferson Blvd.
SPOKANE, WASH., 1011-1013 First Ave.
SPRINGFIELD, MASS., 211-213 Worthington St.
SYRACUSE, N. Y., 214 S. Clinton St.
TACOMA, WASH., 731 Broadway.
TERRE HAUTE, IND., Deming Hotel Bldg.
TOLEDO, OHIO, 218 N. Erie St.
WASHINGTON, D. C., 1303 H St., N. W.
WHEELING, W. VA., 47 Eleventh St.
WILKES-BARRE, PA., 26 N. Main St.
WILMINGTON, DEL., S. E. Cor. 8th & Tatnall Sts.
WORCESTER, MASS., Graphic Arts Bldg.

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TIRES, Pneumatic (Continued)

Baltimore Rubber Tire Mfg. Co., 11th & Monument Sts. (Orangeville), Baltimore, Md. "Wil-lox."

Beacon Tire Co., Beacon, N. Y.

Ben Hur—See Midland Tire & Rubber Co.

Bergougnan Tire Corp., 49 W. 64th St., New York, N. Y. (Importers.)

Be Saw Tire & Rubber Co., Hartville, O. "Blackford."

Boone Tire & Rubber Co., Chippewa Falls, Wis.

Blackford—See Be Saw Tire & Rubber Co.

Bowers Rubber Works, 68-70 Sacramento St., San Francisco, Cal.

Bowling Green Rubber Co., 1202 Prospect Ave., Toledo, O.

Braender Rubber & Tire Co., Rutherford, N. J. "Bull Dog." (See page 723.)

Brunswick - Balke - Collender Co., 623-33 S. Wabash Ave., Chicago, Ill. (See page 705.)

Buckskin—See L. & M. Rubber Co.

Bucyrus Rubber Co., Bucyrus, O.

Bull—See Kansas City Tire & Rubber Corp.

Bull Dog—See Braender Rubber & Tire Co.

Burdick Tire & Rubber Co., Noblesville, Ind.

California—See Hendrie Rubber Co.

Capitol—See National Tire & Rubber Co.

Carlisle Cord Tire Co., 250 W. 54th St., New York, N. Y.

Carspring—See New Jersey Car Spring & Rubber Co.

Century-Plainfield Tire Co., Plainfield, N. J. (See page 709.)

Century Rubber Works, 1346 Rawsom St., Chicago, Ill.

Champion—See McLean Tire & Rubber Co.

Chester—See Kansas City Tire & Rubber Co.

Circle Tyre & Rubber Co., Circle Bldg., New York, N. Y. (See page 709.)

Cleveland—See Standard Tire & Rubber Mfg. Co.

Columbiana Tire & Rubber Co., Columbiana, O.

Combination Rubber Mfg. Co., Bloomfield, N. J.

Community Rubber Co., Morrisville, Pa. "Delaware."

Congress—See McGraw Tire & Rubber Co.

Continental Rubber Works, 1902 Liberty St., Erie, Pa. "Vitalic."

Converse Rubber Shoe Co., Malden, Mass. "Tuff-E-Nuff."

Cortland Tire & Rubber Co., 342 Cortland St., Belleville, N. J.

Crown Tire & Rubber Co., Ralston, Neb.

Cupples Co., Seventh & Spruce Sts., St. Louis, Mo.

Curtis Tire & Rubber Co., Muskegon, Mich.

Dayton Rubber Mfg. Co., 2346 Kiser St., Dayton, O.

De Luxe—See Goodrich Co.

Defiance Tire Factories, 826 W. Randilph St., Chicago, Ill., "Arabian."

Delaware—See Community Rubber Co.

Delion, Tire & Rubber Co., E. State St., Trenton, N. J.

Dixie—See Dreadnaught Tire & Rubber Co.

Dodge, H. V., 1692 Broadway, New York, N. Y. (Dealers.) (See page 701.)

Double Fabric Tire Co., 60 W. Ninth St., Auburn, Ind.

Doughty Tire Co., 115 Wickenden St., Providence, R. I.

Dowse Rubber Co., 123 S. Michigan Ave., Chicago, Ill.

Dreadnaught Tire & Rubber Co., Eager & Fifth Sts., Baltimore, Md. "Dixie."

Dural Rubber Corp., Maple Ave., Flemington, N. J.

East Palestine Rubber Co., East Palestine, O. "Naboh."

Ehman Tire & Rubber Co., 27th & La Salle Sts., Chicago, Ill.

Empire Rubber & Tire Co., Mulberry St. & Clinton Ave., Trenton, N. J.

Endurance Tire & Rubber Co., New Brunswick, N. J.

Eureka Tire Co., Trenton, N. J.

Excel Rubber Co., Wadsworth, O. "X-L."

Fabric Cord Tire Co., Marquette Bldg., Chicago, Ill.

Fairfield Clingstone—See Lancaster Tire & Rubber Co.

Falls Rubber Co., Cuyahoga Falls, O. "Greyhound."

Federal Rubber Co. (Cudahy), Milwaukee, Wis.

Firestone Tire & Rubber Co., Miller & Sweitzer Aves., Akron, O.

Fisk Rubber Co. of New York, Chicopee Falls, Mass. (See page 709.)

General Tire & Rubber Co., E. Market St., Akron, O. "Jumbo."

Gillette Rubber Co., Eau Claire, Wis.

Globe Rubber Tire Mfg. Co., Trenton, N. J.

Goodrich Co., B. F., S. Main St., Akron O. "Silvertown," "De Luxe."

Goodyear Tire & Rubber Co., Akron, O. (See page 861.)

Gordon Tire & Rubber Co., Seventh St. & B. & O. R. R., Canton, O. "Ideal."

Greyhound—See Falls Rubber Co.

Gripwell—See Universal Rubber Co.

Grypon Rubber & Tire Co., Bailey Ave. & 192d St., New York, N. Y.

Hamilton Rubber Mfg. Co., Mead & Prince Sts., Trenton, N. J.

Hanes Rubber Co., Winston-Salem, N. C.

Hardman Rubber Corp., Belleville, N. J. (See page 867.)

Hartford Rubber Works Co., 1790 Broadway, New York, N. Y.

Hawkeye Tire & Rubber Co., 215 E. Third St., Des Moines, Ia. "Santa Fe."

Hendrie Rubber Co., W. C., Torrance, Cal. "California."

Hester Tire & Rubber Co., 5200 Euclid Ave., Cleveland, O.

Highway—See National Tire & Rubber Co.

Hood Tire Co., Watertown, Mass. (See pages 693 and 694.)

Horseshoe—See Racine Auto Tire Co.

Ideal—See Gordon Tire & Rubber Co.

Imperial—See McGraw Tire & Rubber Co.

India Tire & Rubber Co., Akron, O.

Indiana Rubber & Insulated Wire Co., Jonesboro, Ind.

International India Rubber Corp., Ewing Ave. & Vandalia R. R., South Bend, Ind.

J. & D. Tire & Rubber Co., Charlotte, N. C.

Jandorf Auto Co., 1763 Broadway, New York, N. Y. (Dealers.) (See page 725.)

Johnstone Tire & Rubber Co., Peoples Gas Bldg., Chicago, Ill. (See page 297.)

Jumbo—See General Tire & Rubber Co.

Kansas City Tire & Rubber Corp., Kansas City, Mo. "Bull," "Chester," "Traveler."

Kelly-Springfield Tire Co., 220 W. 57th St., New York, N. Y.

Keystone Rubber Mfg. Co., Erie, Pa.

Kimball Tire & Rubber Co., Dept. C., 1469 Michigan Ave., Chicago, Ill. (See page 709.)

Kokomo Rubber Co., 1042 S. Main St., Kokomo, Ind.

L. & M. Rubber Co., Carrollton, O.

Lancaster Tire & Rubber Co., Columbus, O. "Fairfield Clingstone." (See page 717.)

Lee Tire & Rubber Co., 245 W. 55th St., New York, N. Y.

Lincoln Highway Tire Co., Fulton, Ill.

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"Tie Up" with a Live Money Making Line

The Victor-Springfield Tire is hand built of highest quality materials possible to obtain.

The extra value built into Victor-Springfield Tires is multiplied in service to the user.

An unusually pleasing appearance emphasizes the tire's high quality and attracts the admiration of the buyer.

Dealers write us for our protection proposition.

LIST PRICES, APRIL 22, 1918
NET PRICES

Siz	Casings		Victor Tubes	
	Ribbed	Non-Skid	Black	Red
28x3	.....	$21.00	$3.40	$3.75
30x3	$20.80	22.30	3.65	3.95
30x3½	25.80	27.65	4.25	4.65
31x3½	.....	30.95	4.55	5.30
32x3½	29.90	31.75	4.70	5.40
31x4	39.90	42.60	5.70	6.35
32x4	41.70	43.35	5.85	6.55
33x4	42.35	45.20	6.00	6.70
34x4	43.10	46.10	6.15	6.95
35x4	.....	48.90	6.45	7.10
36x4	.....	48.40	6.60	7.25
32x4½	.....	58.40	7.50	8.45
33x4½	.....	58.70	7.65	8.55
34x4½	53.80	59.30	7.80	8.70
35x4½	56.05	60.50	8.00	8.95
36x4½	56.55	63.55	8.20	9.15
37x4½	.....	70.00	8.35	9.30
33x5	.....	73.70	9.10	10.10
35x5	66.70	74.80	9.35	10.35
36x5	67.60	75.65	9.50	10.55
37x5	70.10	78.55	9.75	10.80
37x5½	.....	100.60	10.30	11.65
38x5½	.....	101.65	10.60	11.85
895x135	.....	78.95	9.50	10.60
920x120	.....	75.00	8.65	9.65

Made in all popular sizes. Plain, Ribbed and Non-Skid Treads. Straight Side, Q. D. Clincher and Clincher Types.

GUARANTEE

5000 Miles

On Non-Skid, Ribbed and Plain Treads

THE MOST COMPLETE LINE
HIGHEST QUALITY
MODERATE PRICES
LIBERAL GUARANTEE

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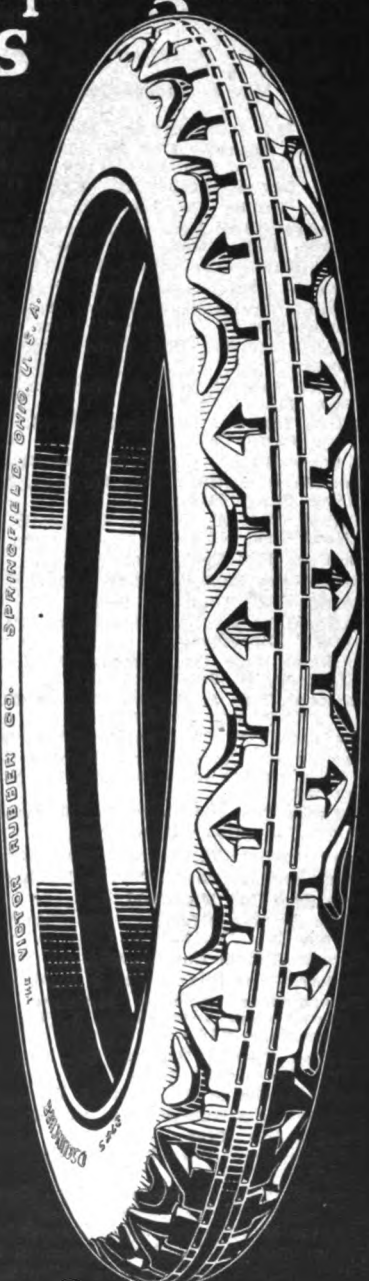
"COMING FAST"
Springfield **Ohio**



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TIRES, Pneumatic (Continued)

Lion Tire & Rubber Corp., Union Street Rd., Lafayette, Ind.

Long-Wear Rubber Co., 9-11 East Ave., Elyria, O.

Lyon—See Auto Tire Sales Co.

McAllister, Frank, 1761 Broadway, New York, N. Y. (Dealer.) (See page 701.)

McCreary Tire & Rubber Co., 15th & School Sts., Indiana, Pa.

McGraw Tire & Rubber Co., East Palestine, O. "Imperial," "Congress," "Pullman."

McLean Tire & Rubber Co., East Liverpool, O. "Champion."

Mansfield Tire & Rubber Co., Newman St., Mansfield, O. "Ohio," "United," "American."

Marathon Tire & Rubber Co., Cuyahoga Falls, O.

Marion Tire & Rubber Co., Marion, O.

Martin, James, 106 W. 52nd St., New York, N. Y. (Dealer.) (See page 719.)

Mason Tire & Rubber Co., Kent, O.

Mattson Rubber Co., Lodi, N. J.

Mercury Tire Co., 1789 Broadway, New York, N. Y. (Dealers.) (See page 719.)

Meyer Rubber Co., Sloan Bldg., Cleveland, O.

Michelin Tire Co., Milltown, N. J.

Midland Tire & Rubber Co., Cambridge Rd. Coshocton, O. "Peerless," "Ben Hur."

Millbury Rubber Co., Howe Ave., Millbury, Mass.

Miller, Chas. E., 1400 S. Meridian St., Anderson, Ind.

Miller Rubber Co., Dept. A 43, Akron, O. (See page 705.)

Mohawk Rubber Co., E. Market St., Akron, O.

Montford Rubber Co., Buffalo, N. Y. (See page 719.)

Mutual Tire & Rubber Co., 9 E. 40th St., New York, N. Y.

Na-Peer Tire Co., Akron, O.

Nabob—See East Palestine Rubber Co.

Nassau—See Thermoid Rubber Co.

National Rubber Co., Pottstown, Pa. "Autocrat," "Speedway."

National Tire Co., Broad St Bank Bldg., Trenton, N. J.

National Tire & Rubber Co., East Palestine, O. "Capitol," "Highway."

Needham Tire Co., Charles River, Mass.

New Jersey Car Spring & Rubber Co., Wayne & Brunswick Sts., Jersey City, N. J. "Carspring."

Norwalk Tire & Rubber Co., Norwalk, Conn.

O. K.—See Oliver Rubber Mfg. Co.

Odell Rubber Co., George, South Bend, Ind.

Ohio—See Mansfield Tire & Rubber Co.

Ohio Tire Co., Mansfield, O.

Oliver Rubber Mfg. Co., 2203 Broadway, Oakland, Cal. "O. K."

Orrville Rubber Co., Orrville, O.

Packard—See Pharis Tire & Rubber Co.

Paramount Tire & Rubber Co., 1834 Broadway, New York, N. Y. (Dealers.) (See page 719.)

Parker Tire & Rubber Co., Indianapolis, Ind. (See page 857.)

Peerless—See Midland Tire & Rubber Co.

Pennsylvania Rubber Co., Jeannette, Pa.

Perfection Tire & Rubber Co., 1002 S. Michigan Ave., Chicago, Ill. (See page 717.)

Pharis Tire & Rubber Co., Newark, O. "Packard." (See page 717.)

Portage Rubber Co., Barberton, O.

Porter Rubber Co., News Bldg., Salem, O.

Pullman—See McGraw Tire & Rubber Co.

Quaker City Rubber Co., 629 Market St., Philadelphia, Pa.

Quality Tire & Rubber Co., 1467 Michigan Ave., Chicago, Ill.

Racine Auto Tire Co., State St., Racine, Wis. "Horseshoe."

Racine Rubber Co., Racine, Wis.

Republic Rubber Co., Youngstown, O.

Rubber Products Co., Barberton, O. "Stronghold."

Santa Fe—See Hawkeye Tire & Rubber Co.

Savage Tire Co., Main & Sicord Sts., San Diego, Cal.

Seamless Rubber Co., 534 Congress Ave., New Haven, Conn.

Silvertown—See Goodrich Co.

Smith Canvas Tread Tire Co., 69 Genesee St., Utica, N. Y.

Speedway—See National Rubber Co.

Standard Four Tire Co., 32d St. & Jackson Ave., Keokuk, Ia.

Standard Tire & Rubber Mfg. Co., Willoughby O. "Cleveland."

Star Rubber Co., 1072 Crozier St., Akron, O.

Sterling Tire Corp., Rutherford, N. J.

Stronghold—See Rubber Products Co.

Swinehart Tire & Rubber Co., North & Howard Sts., Akron, O.

Ten Broeck Tyre Co., Dept. A, Louisville, Ky. (See page 705.)

Thermoid Rubber Co., Trenton, N. J. "Nassau." (See pages 373 and 397.)

Toliver Tube & Tire Co., 734 14th St., Denver, Colo.

Transit—See Universal Rubber Co.

Traveler—See Kansas City Tire & Rubber Corp.

Traveler Tire & Rubber Co., 819 N. Broad St., Philadelphia, Pa.

Tred-Wel—See Twin Tube & Rubber Co.

Triumph Tire & Rubber Co., 1765 Broadway, New York, N. Y.

Tropical Tire & Rubber Co., 51 Leonard St., New York, N. Y.

Tuff-E-Nuff—See Converse Rubber Shoe Co

Twin Tube & Rubber Co., 1002 S. Michigan Ave., Chicago, Ill. "Tred-Wel."

Tyer Rubber Co., Andover, Mass. "Tyrian."

Tyrian—See Tyer Rubber Co.

United—See Mansfield Tire & Rubber Co.

United States Tire Co., Broadway & 58th St., New York N. Y. (See page 695.)

Universal Rubber Co., Broad & Wood Sts., Philadelphia, Pa. "Gripwell," "Transit."

Victor Rubber Co., Springfield, O. (See page 697.)

Vitalic—See Continental Rubber Works.

Wearwell—See Wilson Tire & Rubber Co.

Wil-lox—See Baltimore Rubber Tire Mfg. Co.

Wilson Tire & Rubber Co., Harvard Pk., Springfield, Ill. "Wearwell."

Woodworth Mfg. Co., Niagara Falls, N. Y. (See page 721.)

X-L—See Excel Rubber Co.

Zee-Zee Rubber Co., Yardville, N. J.

TIRES, Rebuilt

Loewenthal & Co., R. M., 51 E. 42d St., New York, N. Y. (See page 699.)

TIRES, Solid

American Rubber & Tire Co., 100 Beach St., Akron, O.

Bergougnan Tire Corp., 49 W. 64th St., New York, N. Y. (Importers.)

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Non-Skid Designs

The
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TIRES, Solid (Continued)

Bucyrus Rubber Co., Bucyrus, O.
Firestone Tire & Rubber Co., Miller & Sweitzer Aves., Akron, O.
Gibney Tire & Rubber Co., Conshohocken, Pa.
Goodyear Tire & Rubber Co., Akron, O. (See page 861.)
Hood Tire Co., Watertown, Mass. (See pages 693 and 694.)
Indian Tire & Rubber Co., New Brunswick, N. J. (See page 701.)
Johnstone Tire & Rubber Co., Peoples Gas Bldg., Chicago, Ill. (See page 297.)
Kelly-Springfield Tire Co., 220 W. 57th St., New York, N. Y.
McGraw Tire & Rubber Co., East Palestine, O.
Milford Rubber Works, Milford, Ill.
Owen Tire & Rubber Co., 1900 Euclid Ave., Cleveland, O.
Polack Truck Tyre Co., 1876 Broadway, New York, N. Y.
Republic Rubber Co., Youngstown, O.
United States Tire Co., Broadway & 58th St., New York, N. Y. (See page 695.)
Victor Rubber Co., Springfield, O. (See page 697.)
Vulcan Rubber Co., West Lake Rd., Erie, Pa. "Vulco."
Vulco—See Vulcan Rubber Co.

TIRES, Special

(Cushion, Sectional, Wood, Spring, etc.)

American Wood Tire Co., 1631 Monadnock Blk., Chicago, Ill.
Bonner—See Story, Ernest D.
Burgess Patent Tire & Mfg. Co., 19th & Campbell Sts., Kansas City, Mo.
Compression Inner Tube Co., Rome, Ga.
Dayton Rubber Mfg. Co., 2346 Kiser St., Dayton, O.
Goodyear Tire & Rubber Co., Akron, O. "Motz" (See page 861.)
Lambert Multiplus Co., 125 Grand Ave., Portland, Ore. "Trubipruf."
Lee Tire & Rubber Co., 245 W. 55th St., New York, N. Y.
McNaull Tire Co., Toledo, O. (See page 717.)
Molitor Tire Co., 4241 Irving Park Blvd., Chicago, Ill.
Motz—See Goodyear Tire & Rubber Co.
Pan-American Rubber Co., 721 Grand Ave., Milwaukee, Wis.
Pickett Puncture Proof Tire Co., 6015 Michigan Ave., St. Louis, Mo.
Pneumatic-Cushion Inner Tube Co., 1 Appleton St., Boston, Mass.
Ross-Lambert Rubber Co., Cincinnati, O.
Rubber Insulated Metals Corp., Plainfield, N. J.
Story, Ernest D., 1328 Broadway, New York, N. Y. "Bonner."
Superior Tire & Rubber Co., 4511 N. Broad St., Philadelphia, Pa.
Swinehart Tire & Rubber Co., North & Howard Sts., Akron, O.
Tension Tire Co., York, Pa.
Trubipruf—See Lambert Multiplus Co.
Wearwell—See Wilson Tire & Rubber Co.
Wilson Tire & Rubber Co., Harvard Pk., Springfield, Ill. "Wearwell."
Woodworth Mfg. Co., Niagara Falls, N. Y. (See page 721.)

TIRES, SPRING—See Tires, Special; also Wheels, Special

TOE CLIPS, MOTORCYCLE—See Clips, Motorcycle, Toe

TOILET CASES—See Cases, Toilet

TONNEAU SHIELDS—See Shields, Tonneau

TOOL BAGS—See Bags, Tool

TOOL BOX LOCKS—See Locks, Cabinet and Pad; also Catches, Spring

TOOL BOXES—See Boxes, Tool

TOOL CHECKS—See Checks, Brass Time, Tool and Pay

TOOL GRINDERS—See Grinders

TOOL HOLDERS—See Holders, Lathe and Planer Tool

TOOL KITS—See Kits, Tool

TOOL POST GRINDERS—See Drills, Electric Portable

TOOL POSTS—See Posts, Tool

TOOL RACKS—See Racks, Metal Tool

TOOL ROLLS—See Bags, Tool

TOOL STEEL—See Steel

TOOLS, BEARING PULLING—See Pullers, Bearing

TOOLS, CHAIN ATTACHING—See Tools, Tire Chain Attaching

TOOLS, Chain Repair

(Tools or Clamps for drawing together the ends of broken driving chains to facilitate making repairs)

Brown & Son, J. C., Butler, Ind.
Handee—See Racine Handy Mfg. Co.
Harris & Reed Mfg. Co., 1510-22 W. 15th St., Chicago, Ill.
Macquic—See Macdonald & Co.
Necessity—See Macdonald & Co.
Macdonald & Co., J. N., Wethersfield, Conn. "Necessity," "Macquic."
Racine Handy Mfg. Co., 107 Fifth St., Racine, Wis. "Handee."

TOOLS, COTTER PIN—See Pullers, Cotter Pin

TOOLS, Crankshaft Grinding

(For Crankshaft Grinding Machines—See Grinders, Crank Pin)

Peters Engineering Co., 3202-04 Chestnut St., Philadelphia, Pa.

TOOLS, CYLINDER REBORING—See Machines, Portable Cylinder Reboring and Regrinding

TOOLS, Cylinder Reboring, for Fords

Davis—See Hinckley Machine Works.
Heiser's Special Tool Co., Rogers Bldg., Kingston, Mo.
Hinckley Machine Works, Hinckley, Ill. "Davis."
Storm Mfg. Co., Dept. D, Thompson, Ia. (See page 621)

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There's Big Money Selling Factory Blemish Tires

Being direct factory distributors of blemished tires, or so-called seconds, I can offer you a very interesting money making proposition—something out of the ordinary.

I only handle the well known STANDARD makes of tires—and in point of service these seconds will give a wonderful mileage record.

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RED INDIAN AND INDIAN CHIEF

Solid Motor Truck Tires

Indians are Red

The Better Kind

Some Distinctive Points About Indian Motor Truck Tires

They give an average of better than ten thousand miles of service.

It is the only Red motor truck tire on the market.

So efficient are these tires that our claims for adjustments have been less than 4/10 of one per cent of our sales since the first tire was made.

We are specialists in motor truck tires—and make nothing else.

The extra profile and volume of tread rubber on all of our types make the price of Indian tires reasonable in comparison with truck tires of other makes.

We sell absolutely nothing retail. We distribute entirely through reliable jobbers, whom we give exclusive selling rights for periods covering one to five years.

Price List Effective April 1, 1918

Red Indian—Regular Profile

36 x 3	$42.80	38 x 5	$78.00
34 x 3½	47.90	40 x 5	82.20
36 x 3½	50.40	34 x 6	85.30
32 x 4	52.10	36 x 6	89.90
34 x 4	55.00	38 x 6	95.10
36 x 4	58.20	40 x 6	100.00
34 x 5	69.20	36 x 7	111.80
36 x 5	73.70	40 x 7	124.30

Indian Chief—High Profile

34 x 5	$82.00	40 x 6	$129.30
36 x 5	86.90	36 x 7	150.70
40 x 5	97.30	40 x 7	165.50
36 x 6	116.80		

TERMS, 5 PER CENT CASH 10 DAYS

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John Wanamaker	New York
Bloomingdale Bros.	New York
United Dressed Beef Co.	New York
Acker, Merrill & Condit	New York

DISTRIBUTORS OF INDIAN TIRES

Indian Tire Sales Co., Inc., 213 West 64th St., New York City, Eastern Sales Agents.
James J. Matthews, Paterson, N. J.
J. B. Richardson & Sons, Trenton, N. J.
Nelson Truck Tire & Wheel Shop, Brooklyn, N. Y.
Indian Tire Sales Co., Baltimore, Md.
W. J. Scultatus, Norfolk, Va.
Indian Tire & Accessories Co., Reading, Pa.
Theo. A. Brightman, New Bedford, Mass.
Holcomb Repair Co. Hartford, Conn.
Para Company Trenton, N. J.

Write us today for terms of our attractive exclusive rights to solid tire dealers and distributors.

Indian Tire & Rubber Co.

New Brunswick, N. J.

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TOOLS, Dealers in

(Comprising only Dealers in Tools who advertise in this Publication)

Chicago Tool & Kit Mfg. Co., 6 E. Lake St., Chicago, Ill. (See page 703.)

Dunkle Co., Arthur J., 50 Church St., New York, N. Y. (See page 671.)

Reliance Steel & Tool Co., 24-26 Murray St., New York, N. Y. (See page 275.)

TOOLS, Demountable Rim Contracting

(Tools or Clamps for contracting or expanding split demountable rims to facilitate the changing of tires)

Abbe, E. W., 19 Curtis St., New Britain, Conn.

Beach—See Greb Co.

C. S.—See Canton Specialty Co.

Canton Specialty Co., Canton, Ill. "C. S." (See page 609.)

Elka Mfg. Co.—See Zinke Co.

Eureka Rim Compressor—See Zinke Co.

Fish-Best Co., 326 River St., Chicago, Ill.

Friestedt Mfg. Co., 2928-32 W. Lake St., Chicago, Ill.

G. T. L.—See Metal Products Co.

Greb Co., 195 State St., Boston, Mass. "Beach." (See page 531.)

Holmes, George L., 1733 Broadway, New York, N. Y. (Eastern Distributor for "Beach" Tools.) (See page 383.)

Hoof & Co., John C., 157 W. Illinois St., Chicago, Ill.

Hurst Mfg. Co., H. L., Canton, O. "Quick-Ezy."

K. P. Mfg. Co., 250 W. 54th St, New York, N. Y.

Lawco—See Lawson Co.

Lawson Co., F. H., Dept. D, Cincinnati, O. "Lawco." (See page 663.)

Lewsen Mfg. Co., Portland, Me.

Metal Products Co., 2416 University Ave., Minneapolis, Minn. "G. T. L."

Midland Supply Co., 209 E. Second St., Davenport, Ia. "Positive."

Million Motor Co., Adrian, Mich. (See page 799.)

Niswander Mfg. Co., Quincy, Ill.

Perfection Rim Tool Co., Minneapolis, Minn.

Positive—See Midland Supply Co.

Quick-Ezy—See Hurst Mfg. Co.

Schultze Machine Shop, Green & Lincoln Sts., Chenoa, Ill.

Standard Parts Co., Cleveland, O. "Stanweld." (See pages 408 and 409.)

Stanweld—See Standard Parts Co.

Weiser's E. Z. Rim Tool Co., 433-35 High St., Hamilton, O.

Zinke Co., 1323-25 Michigan Ave., Chicago, Ill. (Sole Distributors for Eureka Rim Compressor, Addison, N. Y., and Elka Mfg. Co., San Francisco, Cal.

TOOLS, Lathe and Planer

Armstrong Bros. Tool Co., 304 N. Francisco Ave., Chicago, Ill. (See page 773.)

Billings & Spencer Co., Laurel & Park Sts., Hartford, Conn.

Carr—See Thompson & Son Co.

Champion—See Western Tool & Mfg. Co.

Haynes Stellite Co., Citizens Bank Bldg., Kokomo, Ind. "Stellite."

Johnson—See Pratt & Whitney Co.

Marcy Tool Works, Putnam, Conn.

O. K. Tool Holder Co., Shelton, Conn.

Pratt & Whitney Co., 111 Broadway, New York, N. Y. "Johnson," "Rhodes," "Woodbridge." (See page 73.)

Rhodes—See Pratt & Whitney Co.

Stellite—See Haynes Stellite Co.

Stortz & Son, John, 210-12 Vine St., Philadelphia, Pa.

Thompson & Son Co., Henry G., 492 State St., New Haven, Conn. "Carr."

Union Tool Co., Orange, Mass.

Western Tool & Mfg. Co., Springfield, O. "Champion."

Woodbridge—See Pratt & Whitney Co.

TOOLS, Piston Ring Removing

(Special pliers or tongs for removing rings from pistons)

Empire—See S. B. R. Specialty Co.

Hartenstein, R. P., 542 S. Dearborn St., Chicago, Ill. "Utility."

Morgan Mfg. Co., Keene, N. H.

Protex Mfg. Co., 13-17 N. Jefferson St., Chicago, Ill. (See page 275.)

Rush, W. S., 2213-15 N. Broadway, Los Angeles, Cal.

S. B. R. Specialty Co., 17-19 Princeton St., East Orange, N. J. "Empire."

Utility—See Hartenstein, R. P.

Wilhelm-Smith Machine Co., 926 Bingaman St., Reading, Pa.

TOOLS, Piston Ring Compressing, for Fords.

(To facilitate the entering of piston and ring into cylinder)

Morgan Mfg. Co., Keene, N. H.

Nelson Mfg. Co., A., 2700 Southport Ave., Chicago, Ill.

TOOLS, PLANER—See Tools, Lathe and Planer

TOOLS, RIM CONTRACTING—See Tools, Demountable Rim Contracting

TOOLS, RING REMOVING—See Tools, Piston Ring

TOOLS, SCRAPING—See Scrapers

TOOLS, SPEEDOMETER GEAR CENTERING—See Jigs, Speedometer Gear

TOOLS, Spring Leaf Separating

(For separating the spring leaves so they may be lubricated; for Spring Leaf Cups—See Cups and Covers, Spring Leaf Lubricating; for Spring Leaf Lubricating Strips—See Strips, Spring Leaf Lubricating)

Buckeye—See Central Brass & Fixture Co.

Central Brass & Fixture Co., Dept. A., Springfield, O. "Buckeye." (See page 137.)

Cincinnati Tool Co., 1951 Waverly Ave., Norwood, O.

Cochran Pipe Wrench Mfg. Co., 7544 S. Chicago Ave., Chicago, Ill.

Halladay Co., L. P., 501 N. Monroe St., Streator, Ill.

Knowlsons—See Spring Leaf Lubricator Co.

Manzel Co., Chas. W., 309 Beard Ave., Buffalo, N. Y. "Tomahawk."

Metal Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

Norton—See Spencer's Sons.

Spencer's Sons, I. S., Guilford, Conn. "Norton."

Spring Leaf Lubricator Co., Ann Arbor, Mich. "Knowlsons."

Standard Engineering Works, 59 Social St., Woonsocket, R. I.

Tomahawk—See Manzel Co.

Winther & Sons, C. W., Fresno, Cal.

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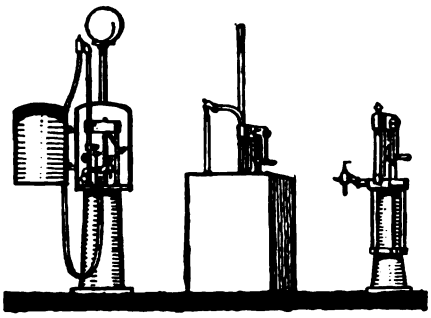
30 STYLES OF OIL AND GASOLINE OUTFITS



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Floor Tanks for Oils.
Long Distance Self - Measuring Pumps.
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Outfits for Retailing Oils and Gasoline. The Largest Line.

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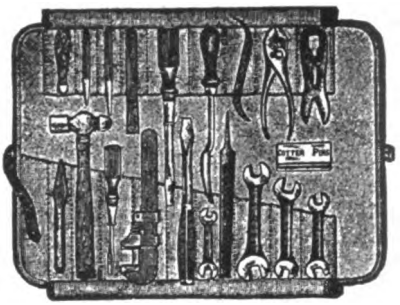

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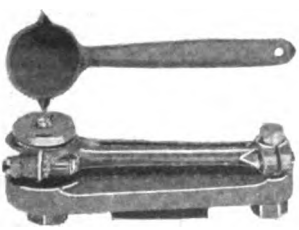


Honn's Babbitt Jig and Crank Shaft Babbitting Mandrel.

Every Ford car repairman needs one of these tools. Price $6.00.

Honn Babbitting Jig.

Four shafts and eight collars furnished with this jig to fit the various sizes of connecting rods. This Jig is made adjustable so that the exact alignments are maintained. Can be lengthened or shortened by loosening one nut. Price $12.00.

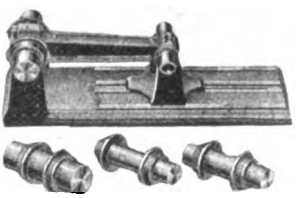
Easy Off Wheel Remover.

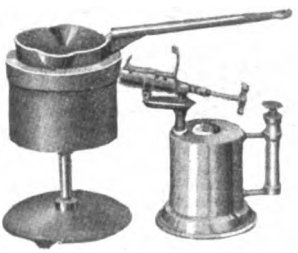
No repair shop can call itself complete without a set of "Easy Off" wheel removers—a size for every wheel in general use.

Price—set of six in wooden box $3.00.

Honn Blow Torch Furnace.

A very simple and convenient Babbitt Melting Furnace—will melt babbit ready to pour in 5 minutes. Price: Furnace $4—Blow Torch $8—Ladle $1.50.





Honn Babbitting Mandrel for Ford Cars.

With this tool any repair man can renew the main crank shaft bearing of the Ford engine. Price $8.00.

PETER HONN, 578 Stocking Avenue, N. W., Grand Rapids, Mich.

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TOOLS, STUD BOLT—See Extractors, Stud Bolt

TOOLS, Terminal Cleaning

Xander, J. G., 824 Court St., Reading, Pa.

TOOLS, Threading

Armstrong Bros. Tool Co., 304 N. Francisco Ave., Chicago, Ill. (See page 773.)

Geometric Tool Co., Blake & Valley Sts., New Haven, Conn.

Modern Tool Co., Fourth & State Sts., Erie, Pa.

Rickert-Shafer Co., Erie, Pa.

Rivett Lathe & Grinder Co., 1 Brooks St. (Brighton), Boston, Mass.

TOOLS, Tire

(For taking off and putting on tires)

Attwood Brass Works, Grand Rapids, Mich. (See page 531.)

Becco—See Michigan Motor Specialties Co.

Bjornlie Mfg. Co., 129 N. Broadway, Watertown, S. Dak. "Perfect."

Bridgeport Hardware Mfg. Corp., 461 Iranistan Ave., Bridgeport, Conn.

Cainan Tire Remover Co., West Upton, Mass.

Carlson & Co., Charles G., 3725 Wall St., Chicago, Ill. "Star."

Central Brass & Fixture Co., Dept. A., Springfield, O. "Springfield." (See page 137.)

Cox Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y.

Eberhard Mfg. Co., 2734 Tennyson Rd., Cleveland, O.

Embrey & Co., H. L., 2635 Madison St., Chicago, Ill.

Gemco Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. (See page 135.)

General Appliance Co., 19th St. & Western Ave., Chicago, Ill.

Goodrich-Lenhart Mfg. Co., 429 Widener Bldg., Philadelphia, Pa. (See page 111.)

Hoover Co., W. H., New Berlin, O.

J. P. Tire Tool Co., York, Neb.

L. & M.—See Long Machine Works.

Long Machine Works, Adam A., Ave. E & St. Paul St., Rochester, N. Y. "L. & M."

Mason Auto Clincher Tire Remover & Replacer Co., 122-24 Broadway, Paducah, Ky.

Metal Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

Michigan Motor Specialties Co., 26-40 Dubois St., Detroit, Mich. "Becco."

Morgan Mfg. Co., Keene, N. H.

National Jack & Mfg. Co., 130-34 S. Clinton St., Chicago, Ill.

Nelson, A. A., Warrenton, Va.

Nelson Mfg. Co., A., 2700 Southport Ave., Chicago, Ill.

New Era Spring & Specialty Co., 1138 Hamilton St., N. W., Grand Rapids, Mich. "Off-and-On." (See page 355.)

Off-and-On—See New Era Spring & Specialty Co.

Perfect—See Bjornlie Mfg. Co.

Perfect—See Pratt Mfg. Co.

Perfect Handle—See Smith & Co.

Perfection Mfg. Co., New Martinsville, W. Va.

Pratt Mfg. Co., Wm. E., 35 W. Lake St., Chicago, Ill. "Perfect."

Protex Mfg. Co., 13-17 N. Jefferson St., Chicago, Ill. (See page 275.)

Rhodes Mfg. Co., S. Division St. & First Ave., Grand Rapids, Mich.

Rudolf Tire Tool Co., 1007 James St., N. S., Pittsburgh, Pa.

Smith & Co., H. D., Plantsville, Conn. "Perfect Handle."

Springfield—See Central Brass & Fixture Co.

Star—See Carlson & Co.

Tobey, Wm. L., 9 Lewis St. (E. Boston), Boston, Mass.

U-Sav-Your Mfg. Co., 51 Perkins St., Warren, Mass.

Walker Mfg. Co., Hamilton & Michigan Sts., Racine, Wis.

TOOLS, Tire Chain Attaching

(Screw or toggle clamps to draw ends of tire chains together when putting on wheel so they may be easily hooked or fastened)

Alcemo Mfg. Co., 120 Bridge St., Newark, N. J. (See page 183.)

Buffum Tool Co., Louisiana, Mo.

Foster Bros. Mfg. Co., 811 Broad St., Utica, N. Y.

Geier Co., P. A., 5112 St. Clair Ave., E., Cleveland, O.

Marvel Accessories Mfg. Co., 2011 E. 46th St., Cleveland, O. (See page 763.)

TOOLS, Tire Chain Repair

(Special pliers for removing old and applying new cross sections on tire chains)

Buffum Tool Co., Louisiana, Mo. "Climax." (See page 707.)

Climax—See Buffum Tool Co.

McKaig Drop Forge Co., 14 Perry St., Buffalo, N. Y.

S. M. H. Mfg. Co., Pittsburgh, Pa.

Shelley Tool Co., Saranac Lake, N. Y.

TOOLS, Tire Deflating

(For holding down valve plunger to allow air to escape without removing the plunger)

Sprick Bros. Investment Co., Stickney, S. Dak.

TOOLS, Tire Valve Rethreading

(For recutting threads on outside or inside of tire valves or for refacing end of stem)

A. & H. Mfg. Co., 1987 Broadway, New York, N. Y.

All-In-One—See National Jack & Mfg. Co.

H. & H. Tool Co., 505 W. 45th St., New York, N. Y.

National Jack & Mfg. Co., 130-34 S. Clinton St., Chicago, Ill. "All-In-One."

Nelson Mfg. Co., A., 2700 Southport Ave., Chicago, Ill.

Omega—See Stevens & Co.

Schrader's Son, A., 783-91 Atlantic Ave., Brooklyn, N. Y. (See page 331.)

Stevens & Co., 375 Broadway, New York, N. Y. "Omega."

Victor Tool Co., Waynesboro, Pa.

TOOLS, Valve Grinding

(For Valve Grinding Machines—See Machines, Valve Seating)

Albertson & Co., First & Virginia Sts., Sioux City, Ia. "Sioux."

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Win New Trade and Hold It

AN enormous response has met our forceful campaign of national advertising announcing Uniform Tires to the world.

Authorities agree that Miller uniformity marks a new achievement in tire building.

Uniform Tires—99 in 100—outrun standard guarantees. That means Miller dealers have less than 1% adjustments; that car owners stick to these tires and to the man who sells them.

Don't bother with tires that force you to cut prices to meet competition. There's no profit in that. There is good profit in Miller Tires if you secure control of this line. Write at once for full details.

The Miller Rubber Company
Dept. A43, Akron, Ohio

BRUNSWICK TIRES SHIP NOT

STABILITY

Backed by 73 years of Rubber Manufacturing Experience

—modern factories second to none

—a nation-wide sales organization

—a reputation for fair dealing

—$17,000,000.00 capital

Brunswick Tires and Tubes offer Dealers who look to the future a real opportunity.

The Brunswick-Balke-Collender Co.

General Offices:
623-633 South Wabash Ave., Chicago
Factories: Muskegon, Michigan

Satisfied Customers

are creating a Big Demand for

Ten Broeck Cord Tires

Are you getting your share of this business?

TEN BROECK CORD TIRES are selling in greater number every day. Old customers are coming back for more as they need new tire equipment—

—they also bring their friends and their friends in turn bring their friends—that's how the demand for TEN BROECK TIRES keeps growing so fast.

A dependable cord tire at popular prices.

We have an interesting proposition for dealers. Write today and let us explain to you what it is.

Some of Our Leading Distributors:

Reynolds Tire Sales Co., Tenth Floor, Lexington Bldg., Baltimore, Maryland.
Bond Tire Company, 107 Massachusetts Ave., Boston, Mass.
B. F. Stone, 1207 Broadway, Denver, Colo.

We also manufacture a full line of Standard Fabric Tires.

TEN BROECK TYRE COMPANY

Louisville, Ky.

Dept. A.

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TOOLS, Valve Grinding (Cont'd)

American Valve Tool Mfg. Co., Marion, Conn.

Ashcroft Mfg. Co., 119 W. 40th St., New York, N. Y.

Baldwin—See Universal Valve Grinder Co.

Braunsdorf-Mueller Co., 205 Madison St., Elizabeth, N. J.

Brown Co., 213 Bellevue Ave., Syracuse, N. Y.

Curko—See Graham Roller Bearing Co.

E-Z—See Syracuse Wrench Co.

Flexible Valve Remover Co., N. Main & Cole Sts., Pawtucket, R. I.

Gemco Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. (See page 135.)

Goodell-Pratt Co., Greenfield, Mass. (See page 751.)

Graham Roller Bearing Co., Coudersport, Pa. "Curko."

Healy Tool & Appliance Co., 299 Washington St., Buffalo, N. Y.

Holmes, George L., 1733 Broadway, New York, N. Y. (Eastern Distributor for "Curko" Tools. (See page 383.)

Hudson Motor Specialties Co., 1932 Arch St., Philadelphia, Pa.

Ideal Valve Grinder Co., 1478 W. 22d St., Los Angeles, Cal.

Jackson—See Kalamazoo Railway Supply Co.

Kaiser, L. J., 146 Park Blvd., Detroit, Mich. "Uni-Ver-Sal."

Kalamazoo Railway Supply Co., Kalamazoo, Mich. "Jackson."

Kellogg Mfg. Co., Rochester, N. Y. (See page 533.)

Lamb Mfg. Co., Winsted, Conn.

M-B Tool Co., Danielson, Conn.

Malleable Iron Fittings Co., Branford, Conn. "Mifco."

Marvel Accessories Mfg. Co., 2011 E. 46th St., Cleveland, O. (See page 763.)

Mifco—See Malleable Iron Fittings Co.

Misch—See Motch & Merryweather Machinery Co.

Mosco—See Motor Specialties Co.

Mossberg Co., Frank, Attleboro, Mass. (See page 769.)

Motch & Merryweather Machinery Co., 707 Lakeside Ave., N. W., Cleveland, O. "Misch."

Motor Specialties Co., Pine St., Waltham, Mass. "Mosco."

Owen—See Stewart & Co.

Perfect—See Smith Machine Works.

Perfect—See Stahl Mfg. Co.

Roflo Products Co., L. C. Smith Bldg., Seattle, Wash.

Rothermich, A. P., 2915 N. Taylor Ave., St. Louis, Mo.

Sioux—See Albertson & Co.

Smith Machine Works, Winton L., Newark, N. J. "Perfect."

Stahl Mfg. Co., 983 17th Ave., S. E., Minneapolis, Minn. "Perfect."

Stewart & Co., 351 W. 26th St., New York, N. Y. "Owen."

Syracuse Wrench Co., Syracuse, N. Y. "E-Z." (See page 773.)

Turko—See Turnbull Mfg. Co.

Turnbull Mfg. Co., Wilmington, O. "Turko."

Uni-Ver-Sal—See Kaiser, L. J.

Universal Valve Grinder Co., Almond, Wis. "Baldwin."

Wall, J. H., 290 Hope St., Bristol, R. I.

White Mfg. Co., South Bend, Ind.

TOOLS, Valve Grinding, for Fords

Curko—See Graham Roller Bearing Co.

De Tamble Mfg. Co., 1607-11 Prairie Ave. Chicago, Ill. "Detco."

Detco—See De Tamble Mfg. Co.

Eureka Parts Co., 328 Central Ave., Dunkirk N. Y.

Graham Roller Bearing Co., Coudersport, Pa. "Curko."

Holmes, George L., 1733 Broadway, New York, N. Y. (Eastern Distributor for "Curko" Tools. (See page 383.)

Hudson Motor Specialties Co., 1932 Arch St., Philadelphia, Pa.

Marvel Accessories Mfg. Co., 2011 E. 46th St., Cleveland, O. (See page 763.)

Metal Stamping Co., 13th St & Boulevard, Long Island City, N. Y.

Mossberg Co., Frank, Attleboro, Mass. (See page 769.)

Mosco—See Motor Specialties Co.

Motor Specialties Co., Pine St., Waltham Mass. "Mosco."

Nelson Mfg. Co., A., 2700 Southport Ave., Chicago, Ill.

Perfect—See Smith Machine Works.

Smith Machine Works, Winton L., Newark N. J. "Perfect."

Spiro Mfg. Co., C., 68-72 E. 131st St., New York, N. Y. "Uniq."

Uniq—See Spiro Mfg. Co.

Wall, J. H., 290 Hope St., Bristol, R. I.

White Mfg. Co., South Bend, Ind.

Whitehouse-LeCompte Mfg. Co., 42-54 Elm St., Newark, N. J.

TOOLS, Valve Lifting and Spring Compressing

(For compressing valve springs so that the pin or key may be readily removed or inserted and the valve taken out or put in)

Auburn Ignition Mfg. Co., Auburn, N. Y. (See page 521.)

Au-To Compressor Co., Wilmington, O. "Oro."

Brown, W. C., Niles, O. "Kandikid."

Bryant—See Stevens & Co.

Buffum Tool Co., Louisiana, Mo. (See page 707.)

C. P.—See Clinton Machine Works.

Clinton Machine Works, 460 High St., Clinton, Mass. "C. P."

Curko—See Graham Roller Bearing Co.

E-Z—See Syracuse Wrench Co.

Eberhard Mfg. Co., 2734 Tennyson Rd., Cleveland, O.

Fairmount Tool & Forging Co., 10585 Quincy Ave., Cleveland, O.

Fish-Best Co., 326 River St., Chicago, Ill.

Flexible Valve Remover Co., N. Main & Cole Sts., Pawtucket, R. I.

Fulton Co., 1910 St. Paul Ave., Milwaukee, Wis. (Sole Distributors for American Metal Parts Co., Milwaukee, Wis.) (See page 139.)

Gemco Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. (See page 135.)

Graham Roller Bearing Co., Coudersport, Pa. "Curko."

Hallbauer Lifter Co., 1537 Wellston Ave. (Wellston), St. Louis, Mo.

Hallgren, Carl, 682 Summit Ave., Pasadena, Cal.

Healy Tool & Appliance Co., 299 Washington St., Buffalo, N. Y.

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Buffum Tools

Trade Mark Reg. U. S. Pat. Off.

SPECIFY THEM OF YOUR JOBBER—HE HAS THEM

Double Bent Ends Shaped Screw Drivers

No. 2125—4"x3/16" Blued Fin.....$0.25
No. 2126—5"x¼" Blued Fin..... .30
No. 2127—6"x5/16" Blued Fin..... .35

Curved Bearing Scraper Sets

No. 1766—3" Blade.....$0.35
No. 1767—3½" Blade..... .50
No. 1768—4" Blade..... .65
No. 1765—Set of 3 a box..... 1.50

"Climax" Auto Chain Repair Tools

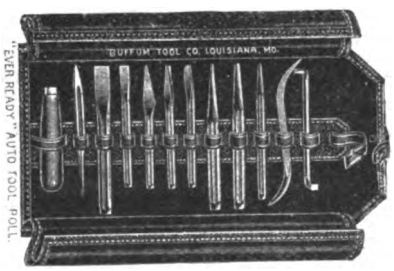
No. 1927—12¾".....$1.25

Cotter Pin Tools

No. 1896—5/16x7" N.P.....$0.25
No. 1900—5/16x7" Pol. Ends..... .22
No. 1902—5/16x6" Oil Fin..... .15

Knurled or Pin Punches

No. 725
⅜x3/32x4"..... $0.25
No. 726
⅜x4/32x4"..... .25
No. 727
⅜x5/32x4"..... .25
No. 728
⅜x6/32x4"..... .25
No. 729
⅜x7/32x4"..... .25
No. 730
⅜x8/32x4"..... .25
Polished Ends.

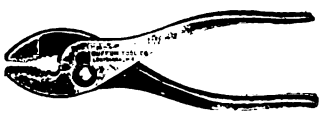


"Ever Ready" Auto Canvas Tool Rolls

Send for Special Tool Kit Catalog
No. 1823—Complete.....$2.25

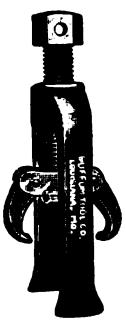
Automobile Punches

No. 658
5/16x⅛x9".....$0.30
No. 659
5/16x3/16x9"... .30
No. 660
⅜x⅛x9"..... .30
No. 661
⅜x3/16x9"..... .30
No. 662
7/16x¼x9"..... .30
No. 663
7/16x5/16x9"... .30
No. 664
½x¼x9"..... .30
No. 665
½x5/16x9"..... .30
Full Polished Blued Fin.



Combination Pliers

No. 2375—5" Blued.....$0.35
No. 2376—5" N.P..... .50
No. 2377—6" Blued..... .50
No. 2378—6" N.P..... .75



Buick Valve Lifters

Price $2.00

Octagon Center Punches

No. 750—¼x2/32x4".....$0.20
No. 751—5/16x3/32x4"..... .20
No. 752—⅜x4/32x4"..... .25
No. 753—7/16x5/32x4"..... .28
Polished Ends.

Buffum Tool Company - Louisiana, Mo., U. S. A.

MANUFACTURERS

"High Grade Tools for High Grade Workmen"

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TOOLS, Valve Lifting and Spring Compressing (Continued)

Hoadley, F. B., 479 Willow St., Waterbury, Conn.

Holmes, George L., 1733 Broadway, New York, N. Y. (Eastern Distributor for "Curko" Tools.) (See page 383.)

Kandikid—See Brown, W. C.

King Mfg. Co., 305 Washington St., Brookline, Mass.

Loomis-Beardsley Mfg. Co., 71 E. State St., Columbus, O.

Mapson & Sperbeck, La Mesa, Cal.

Mechanical & Electrical Mfg. Co., 2227 Prairie Ave., Chicago, Ill. "Triumph."

Merts Co., H. B., 1408 Rutherford Ave., Pittsburgh, Pa.

Metal Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

Milwaukee Auto Specialty Co., 705-15 Chestnut St., Milwaukee, Wis. "Radium."

Morgan Mfg. Co., Keene, N. H. "Utility."

National Jack & Mfg. Co., 130-34 S. Clinton St., Chicago, Ill.

Oro—See Au-To Compressor Co.

Perfect—See Smith Machine Works.

Perfect Handle—See Smith & Co.

Price Auto Tool Works, W. W., Elm Grove, W. Va.

Radium—See Milwaukee Auto Specialty Co.

S. B. R. Specialty Co., 17-19 Princeton St., East Orange, N. J.

Sjoholm, N. P., 11 Westmoreland Pl., St. Louis, Mo.

Smith Machine Works, Winton L., Newark, N. J. "Perfect."

Smith & Co., M. D., Plantsville, Conn. "Perfect Handle."

Stevens & Co., 375 Broadway, New York, N. Y. "Bryant."

Syracuse Wrench Co., Syracuse, N. Y. "E-Z." (See page 773.)

Triumph—See Mechanical & Electrical Mfg. Co.

Turko—See Turnbull Mfg. Co.

Turnbull Mfg. Co., Wilmington, O. "Turko."

Utility—See Morgan Mfg. Co.

Vichek Tool Co., 10709 Quincy Ave., Cleveland, O.

TOOLS, Valve Lifting and Spring Compressing, for Fords

(For compressing valve springs so that the pin may be readily removed or inserted and the valve taken out or put in)

Auburn Ignition Mfg. Co., Auburn, N. Y. (See page 521.)

Curko—See Graham Roller Bearing Co.

Donlin Auto Co., C. A., Hopkins, Mo.

Eberhard Mfg. Co., 2734 Tennyson Rd., Cleveland, O.

Edelmann & Co., E., 341-63 E. Ohio St., Chicago, Ill.

Eureka Parts Co., 328 Central Ave., Dunkirk, N. Y.

Flexible Valve Remover Co., N. Main & Cole Sts., Pawtucket, R. I.

Fulton Co., Milwaukee, Wis. (See page 139.)

Graham Roller Bearing Co., Coudersport, Pa. "Curko."

Halladay Co., L. P., 501 N. Monroe St., Streator, Ill.

Holmes, George L., 1733 Broadway, New York, N. Y. (Eastern Distributor for "Curko" Tools.) (See page 383.)

King Mfg. Co., 305 Washington St., Brookline, Mass.

Loomis-Beardsley Mfg. Co., 71 E. State St., Columbus, O.

Metal Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

Nelson Mfg. Co., A., 2700 Southport Ave., Chicago, Ill.

Parrott Metal Stamping Works, Ohioville, N. Y.

Perfect—See Smith Machine Works.

Schnabel Co., Henry, Greenwich, Conn.

Smith Machine Works, Winton L., Newark, N. J. "Perfect."

Tu-Ford Valve Tool Co., 810 Boutell Pl., Bay City, Mich.

Warnola Mfg. Co., 73 Wooster St., New York, N. Y.

Whitehouse-LeCompte Mfg. Co., 42-54 Elm St., Newark, N. J.

TOOLS, Valve Reseating or Facing

(Special reamers for renewing worn or pitted valve seats and cutters for truing and refacing poppet valves)

Albertson & Co., First & Virginia Sts., Sioux City, Ia. "Sioux."

American Valve Tool Mfg. Co., Marion, Conn.

Bean Co., Berea, O.

Braunsdorf-Mueller Co., 205 Madison St., Elizabeth, N. J.

Brooks Mfg. Co., J. W., 16 Mt. Joy Pl., New Rochelle, N. Y. "Economic."

Crone, F. G., 334 Genesee St., Buffalo, N. Y.

Curko—See Graham Roller Bearing Co.

Economic—See Brooks Mfg. Co.

Graham Roller Bearing Co., Coudersport, Pa. "Curko."

Healy Tool & Appliance Co., 299 Washington St., Buffalo, N. Y.

Holmes, George L., 1733 Broadway, New York, N. Y. (Eastern Distributor for "Curko" Tools.) (See page 383.)

Mullarky, G. E., 578 W. Prairie Ave., Decatur, Ill. "Quinn."

National Auto Specialty Co., Tama, Ia.

Quinn—See Mullarky, G. E.

Sargent, James M., Graniteville, Mass.

Savidge Co., 611 N. Capitol Ave., Indianapolis, Ind.

Sioux—See Albertson & Co.

Skinner Co., M. B., 562 W. Washington Blvd., Chicago, Ill.

TOOLS, Valve Reseating or Facing, for Fords

(Special reamers for renewing worn or pitted valve seats and cutters for truing and refacing valves)

Albertson & Co., First & Virginia Sts., Sioux City, Ia.

Bean Co., Berea, O.

Crone, F. G., 334 Genesee St., Buffalo, N. Y.

Edelmann & Co., E., 341-63 E. Ohio St., Chicago, Ill.

G. B. G. & Mfg. Co., 299 Franklin St., Hempstead, N. Y.

Noonan, D. R., 220 W. Washington St., Paris, Ill.

Savidge Co., 611 N. Capitol Ave., Indianapolis, Ind.

Spiro Mfg. Co., C., 68-72 E. 131st St., New York, N. Y. "Uniq."

Stevens & Co., 375 Broadway, New York, N. Y.

Uniq—See Spiro Mfg. Co.

TOOTH CHAMFERING MACHINES—See Machines, Gear Tooth Chamfering

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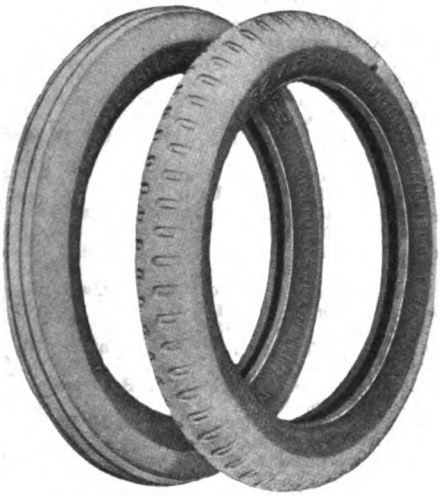
Century-Plainfield

6,000 Miles



Extra Size—Hand Made

Century-Plainfield Tire Co.
Plainfield, New Jersey

FISK TRUCK TIRES

FISK F TRADE MARK

Are Dependable

CIRCLE TYRES

are

HONEST TYRES

With the cost of a deceptive and useless guarantee deducted from the price.

The good-will and repeat orders of our customers are our greatest business asset.

Sit down and write us right now for a really profitable agency.

Circle Tyre & Rubber Co., Inc.
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KIMBALL TIRES

Are Doubling Profits for Dealers

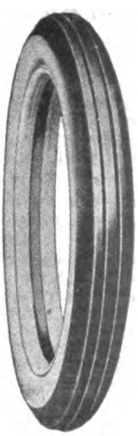
Write for Our Interesting Offer

These tires are sold without a guarantee. Write and ask us how we do it. They are positively not seconds, but first-class fresh casings.

Tires		Tubes	
30x3	$ 9.45	30x3	$ 2.00
30x3½	11.80	30x3½	2.25
32x3½	14.00	32x3½	2.35
32x4	17.45	32x4	3.15
33x4	18.55	33x4	3.20
34x4	19.50	34x4	3.30

Prices on Other Sizes in Proportion

Send us your order today, accompanied by cashier's draft on Chicago or New York or money order. Large and small orders given immediate attention. WRITE TODAY FOR TERRITORY. PLACE YOUR ORDER NOW.



This "Straight Side" Type is Made Also in Clincher Type

The Kimball Tire & Rubber Co. Inc.
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TOOTHING MACHINES, AIRCRAFT PROPELLER—See Machines, Aircraft Propeller Toothing

TOP BOW CLAMPS—See Clamps, Top Bow

TOP BOW DRESSING MACHINES—See Machines, Top Bow Dressing

TOP BOWS—See Bows, Top

TOP CLAMPS—See Holders, Top

TOP CLAMPS FOR FORDS—See Clamps, Top Bow

TOP COVERS—See Covers, Top

TOP CURTAINS—See Curtains, Special Top

TOP DRESSING—See Dressing, Leather; also Dressing, Mohair

TOP ENVELOPES—See Covers, Top

TOP FABRICS—See Cloth; also Broadcloth; also Silk; also Whipcord

TOP FIXTURES—See Fasteners, Curtain; also Fittings, Top; also Irons, Body; also Rests, Bow; also Separators, Bow

TOP HOLDERS—See Holders, Top

TOP HOLDERS FOR FORDS—See Clamps, Top Bow

TOP IRONS—See Irons, Body

TOP LINING DYE—See Dye, Top Lining

TOP PATCHES—See Patches, Top

TOP SHIELDS—See Visors, Top

TOP SOCKETS—See Sockets, Bow

TOP STRAPS—See Straps, Leather

TOP VISORS—See Visors, Top

TOPS, Automobile

(Including cape tops and demountable or winter tops of all kinds)

A-W—See Adams-Williams Mfg. Corp.

Acme Auto Top Co., 1421 Irving St., Washington, D. C.

Adams-Williams Mfg. Corp., 351 W. 52d St., New York, N. Y. "A-W."

All-Season Body Co., Marshall, Mich.

Alvey—See Wardway Vehicle Works.

American Auto Top Co., 1451-53 Washington Blvd., Chicago, Ill.

American Auto Trimming Co., 669 Mack Ave., Detroit, Mich.

American Distributing Co., Kresge Bldg., Detroit, Mich. (Sole Distributors for Rex Mfg. Co., Connersville, Ind.) (See page 661.)

Anchor Top & Body Co., 1890 South St., Cincinnati, O. (See page 865.)

Atlanta Automobile Top & Trimming Co., 755-57 Whitehall St., Atlanta, Ga.

Auto Cape Top Co., 2334-38 S. Michigan Ave., Chicago, Ill.

Auto Leather Goods Co., 11276 Linden Ave., Stratford, Conn.

Automatic Auto Top Co., 20 E. Jackson Blvd., Chicago, Ill. "No-Man."

Baker & Lockwood Mfg. Co., Seventh & Wyandotte Sts., Kansas City, Mo.

Baltimore Buggy Top Co., 107-13 W. Mt. Royal Ave., Baltimore, Md.

Barton Auto Top Co., 841 Woodward Ave., Detroit, Mich.

Birmingham Auto Top Co., 305 S. 20th St., Birmingham, Ala.

Bison Trimming Co., 1133 Jefferson St., Buffalo, N. Y.

Blackbill Auto Enclosure Co., B. F., 226 E. New St., Lancaster, Pa.

Blasier-Sanborn Mfg. Co., 225 Columbia St., Utica, N. Y.

Bliss Auto Top Co., C. P., 12 W. 14th Ave. Denver, Colo.

Blue Ribbon Body Co., 1720 Fairfield Ave., Bridgeport, Conn.

Bohnet & Co., John, Grand Ave. & Washtenaw St., Lansing, Mich.

Boston Auto Top Co., 98-100 Massachusetts Ave., Boston, Mass.

Bridgeport Body Co., 365 Fairfield Ave., Bridgeport, Conn.

Brunn & Co., 950 Ellicott St., Buffalo, N. Y.

Buob & Scheu, 500-10 Webster St., Cincinnati, O. (See page 711.)

Central Auto Top Co., 421-25 N. Capitol Blvd., Indianapolis, Ind.

Chanslor & Lyon Top Co., 1208 S. Grand Ave., Los Angeles, Cal.

Chicago Auto Equipment Co., 808-10 W. Jackson Blvd., Chicago, Ill.

Chicago Carriage & Trimming Co., 3514-20 S. Michigan Ave., Chicago, Ill.

Chicago Coach & Carriage Co., 1223-31 S. Michigan Ave., Chicago, Ill.

Cincinnati Auto Specialty Co., 426 Elm St., Cincinnati, O. "Wilson."

Collings Carriage Co., Front & Arch Sts., Camden, N. J.

Columbia Tire & Top Co., 922 Commonwealth Ave., Boston, Mass.

Consolidated Auto Top Co., 4049-59 St. Clair Ave., Cleveland, O.

Cooling Carriage Co., 402 French St., Wilmington, Del.

Copp Co., George W., 351-55 W. 52d St., New York, N. Y. (See page 227.)

Co-Zee—See Omaha Auto Top Co.

Cream City Trimming Co., 67-71 Juneau Ave., Milwaukee, Wis.

Dallas Buggy Top Co., 562 Main St., Dallas, Tex.

Detachable Limousine Co., 106-10 Grove St., Hempstead, N. Y. "Nassau."

Detroit Weatherproof Body Co., 600 S. Saginaw St., Pontiac, Mich.

Donegan Auto Body & Specialty Co., 338 Trumbull St., Hartford, Conn.

Edwards Mfg. Co., 216-20 Monroe Ave., Detroit, Mich.

Elmwood Auto Top & Supply Co., 707 Main Ave., Elmwood Place, O.

Empire Auto Top Co., 222-26 N. 21st St., Philadelphia, Pa.

Ennis, W. G., 18 Cumberland St., Charleston, S. C.

Erdman-Guider Co., 2290 Woodward Ave., Detroit, Mich.

Farnham-Nelson Co., 47 Union Ave., Boston, Mass.

Fehring Carriage Co., 601-09 Third St., Columbus, Ind.

Gates Mfg. Co., 835 N. Meridian Ave., Indianapolis, Ind.

Geco—See Glover Equipment Co.

Geissel & Sons, A., 485-87 N. Third St., Philadelphia, Pa.

Genesee Mfg. Co., 516-18 Harrison St., Flint, Mich.

Glover Equipment Co., 412 N. Capitol Ave., Indianapolis, Ind. "Geco."

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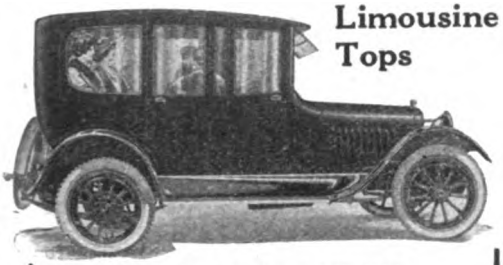
De Luxe Demountable Limousine Tops



Mounted on Chalmers 6-30 (35A)

The transformation of your touring or roadster body into a beautiful and practical closed body is accomplished by the installation of a De Luxe Top designed for Summer and Winter use. In appointment and design De Luxe tops compare favorably with the most costly limousine. We manufacture only

Chalmers *Haynes* *Premier*
Liberty *Cadillac* *Franklin*

for 1916-17 and current models.

Write today for illustrated circular with detailed specifications and prices.

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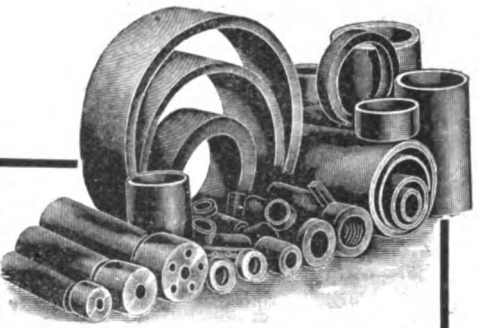

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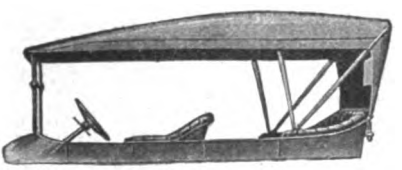
We are usually in position to make immediate shipment from stock of VULCANIZED HARD ROLLED FIBRE TUBING in any standard size from 3/16" to 3" inside diameter and from 1/16" to ¼" thickness of wall.

Standard Mill Lengths are 24" to 36" long, according to size desired, or we will cut to length or machine to order fibre tubing parts.

Instead of using expensive "metal tubes" many concerns have found that they can get just as good results by using FIBRE TUBING.

Write us and we will tell you what we can do for you.

BRANDYWINE FIBRE PRODUCTS CO.
1406 Walnut Street, Wilmington, Delaware



Automobile Tops

Ford Roadster Tops.....$22.10 and up
Ford Touring Car Tops.....$27.60 and up
Touring Car Tops of Other Makes, $40.35 and up

Save one-half the cost of a new top by using our New Auto Top Coverings, made to fit any make or model of Roadster or Touring Car. We make it complete, ready to apply. Anyone can put it on old frame. Prices $7.45 to $32.00.

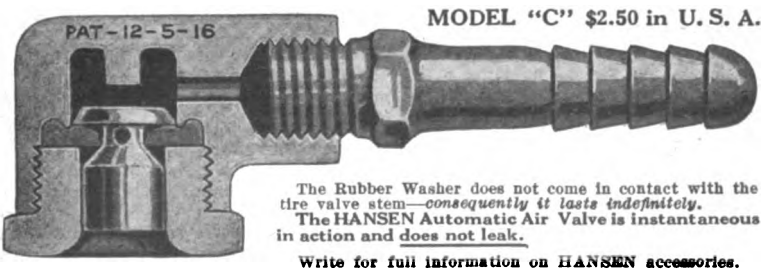
Auto Tops, Seat Covers, Fenders and Other Accessories. Get Our Catalog.

BUOB & SCHEU, 500-510 Webster St., Cincinnati, Ohio

"HANSEN" AUTOMATIC AIR VALVES

HOSE CLAMPS

MODEL "C" $2.50 in U. S. A.



AIR DUSTERS

The Rubber Washer does not come in contact with the tire valve stem—*consequently it lasts indefinitely.*
The HANSEN Automatic Air Valve is instantaneous in action and does not leak.

Write for full information on HANSEN accessories.

THE HANSEN MFG. COMPANY, CLEVELAND, OHIO

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TOPS, Automobile (Continued)

Grundy—See Sterling Top & Equipment Co.
Hartman-Townsend Co., 14th & West Sts., Indianapolis, Ind.
Herrity Co., E. A., 60 Summer St., Stamford, Conn.
Holbrook Co., 166 West End Ave., New York, N. Y.
Holcker-Elberg Mfg. Co., 16th & McGee Sts., Kansas City, Mo.
Holden One-Man Top Co., 1776 Broadway, New York, N. Y.
Indiana Top & Vehicle Co., Laurenceburg, Ind.
Inland Auto Top Factory, 221 S. Monroe St., Spokane, Wash.
Jewett Co., Geo. H., 172-74 Shrewsbury St., Worcester, Mass.
Kingsbury-Leahy Co., Albany, N. Y.
Knapp Co., A. C., 1735 Mt. Elliott Ave., Detroit, Mich.
Koen's Detachable Coupe & Limousine Top Works, 1387 Niagara St., Buffalo, N. Y.
Kroh Mfg. Co., C. Z., 1212-14 Jackson Ave., Toledo, O.
La Due Auto Top Co., 1109 Monroe St., Toledo, O.
Liberty Top & Tire Co., 123 E. Eighth St., Cincinnati, O.
Limousine Top Co., 1900 Factory St., Kalamazoo, Mich. (See page 711.)
Loud, Fred A., Franklin & Lansdowne Sts., Cambridge, Mass.
McDonald Bros., 1009-11 E. Pike St., Seattle, Wash.
Mack Mfg. Co., Lancaster, Pa.
Manhattan Auto Top & Body Co., 221-23 W. 64th St., New York, N. Y.
Mann-Aldrich Carriage Co., 1300 Lincoln St., Denver, Colo.
Motor Products Corporation, Detroit, Mich. (See page 231.)
Motor Row Top Co., 1816-18 S. Fourth Ave., Rock Island, Ill. "Pearson's."
Mount Co., J. W., Maple Ave. & White St., Red Bank, N. J.
Mulholland Co., Washington Ave., Dunkirk, N. Y.
Murray & Co., P. A., Newton, Mass.
Nassau—See Detachable Limousine Co.
National Auto Top Co., 510 W. Broad St., Richmond, Va.
National Limousine Top Corp., 41 Letchworth St., Buffalo, N. Y.
Newton & Son, W. H., 127 Elm St., Cortland, N. Y.
No-Man—See Automatic Auto Top Co.
Novelty Carriage Works, 315-17 Second Ave., Spokane, Wash.
Omaha Auto Top Co., 709-11 S. 15th St., Omaha, Neb. "Co-Zee."
One Hand Auto Top Co., 25 E. Jewett Ave., Buffalo, N. Y.
Paterson Vehicle Co., 257-59 Market St., Paterson, N. J.
Pearson's—See Motor Row Top Co.
Peerless Buggy Top Co., York St. & Central Ave., Cincinnati, O.
Perkins-Campbell Co., 634 Broadway, Cincinnati, O. (See page 227.)
Reardon, J. J., Clark St., Amesbury, Mass.
Rex Mfg. Co.—See American Distributing Co.
Rhodes, W. C., 1611 Vine St., Philadelphia, Pa.
Ross & Browne, 6127-29 Cottage Grove Ave., Chicago, Ill.
Rudd Auto Top Co., 46 Bagg St., Detroit, Mich.
Schreiber Carriage Mfg. Co., Chariton, Ia.
Scott—See Star Storm Front Co.
Sharrer Patent Top Co., 239 W. 56th St., New York, N. Y. (See page 751.)
Shields Carriage Co., 11 Carriage Ave., Amesbury, Mass.
Sioux City Auto Top Co., 310 Virginia St., Sioux City, Ia.
Springfield Auto Top & Upholstery Co., 226 Chestnut St., Springfield, Mass.
Springfield Harness Co., 55-61 Dwight St., Springfield, Mass.
Standard Auto Top & Body Co., 1338 Race St., Philadelphia, Pa.
Standard Top Co., (Kingston), Wilkes-barre, Pa.
Standard Top & Equipment Co., 1212 Huron Rd., Cleveland, O.
Star Storm Front Co., Canal St., Troy, O. "Scott."
Sterling Auto Top Co., Detroit, Mich.
Sterling Top & Equipment Co., 518-22 W. 57th St., New York, N. Y. "Grundy."
Sutorius Auto Top Co., 621-23 Third Ave., S., Minneapolis, Minn.
Thompson Co., E. J. (Forbes Field), Pittsburgh, Pa.
Union Top Mfg. Co., 346 Collins Ave., E., E. Pittsburgh, Pa.
Vehicle Top & Supply Co., 3414 Lindell Ave., St. Louis, Mo. "Vesco."
Vesco—See Vehicle Top & Supply Co.
Vetter Auto Body Co., 214-16 W. 65th St., New York, N. Y.
Warden Co., Geo. J., 6530-34 Carnegie Ave., Cleveland, O.
Wardway Vehicle Works, Chicago Heights, Ill. "Alvey." (See page 715.)
Warner Auto Top Co., 1622-26 Central Ave., Cincinnati, O.
Waynesburg Carriage Co., Waynesburg, O.
Western Auto Top Co., 1208-10 Jackson St., Omaha, Neb.
Wilcox Co., M. I., Water St., Toledo, O.
Wilson—See Cincinnati Auto Specialty Co.
Wilson Co., J. C., 15th & Warren Aves., Detroit, Mich.
Wright & Co., C. E., Norfolk, Va.

TOPS, Special and One-Man, for Fords

A-W—See Adams-Williams Mfg. Corp.
Adams-Williams Mfg. Corp., 351 W. 52d St., New York, N. Y. "A-W."
American Auto Top Co., 1451-53 Washington Blvd., Chicago, Ill.
Anchor Top & Body Co., 1890 South St., Cincinnati, O. (See page 865.)
Baltimore Buggy Top Co., 107-13 W. Mt. Royal Ave., Baltimore, Md.
Biehls Carriage & Wagon Works, 31 S. Fifth St., Reading, Pa.
Blackhill Auto Enclosure Co., B. F., 226 E. New St., Lancaster, Pa.
Central Auto Top Co., 421-25 N. Capitol Ave., Indianapolis, Ind.
Cincinnati Auto Specialty Co., 426 Elm st., Cincinnati, O. "Wilson."
Cleveland Top & Specialty Co., 3102 Franklin Ave., Cleveland, O.
Co-Zee—See Omaha Auto Top Co.
Copp Co., George W., 351-55 W. 52d St., New York, N. Y. (See page 227.)
Cozy Cab—See Fouts & Hunter Carriage Mfg Co.
Cray Bros., 1111 W. 11th St., Cleveland, O.
Daisy—See Miller & Ashe.
Detachable Limousine Co., 106-10 Grove St., Hempstead, N. Y. "Topford."

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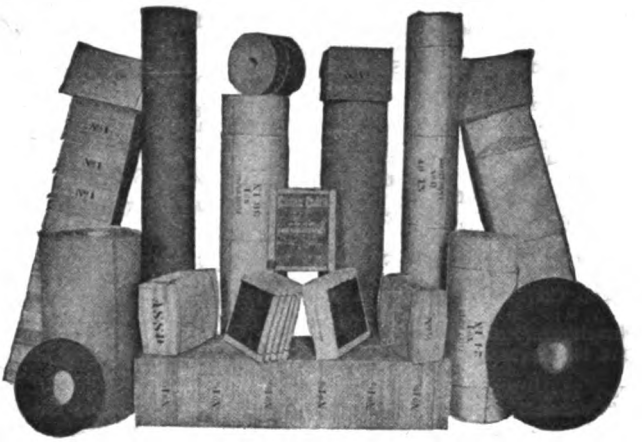

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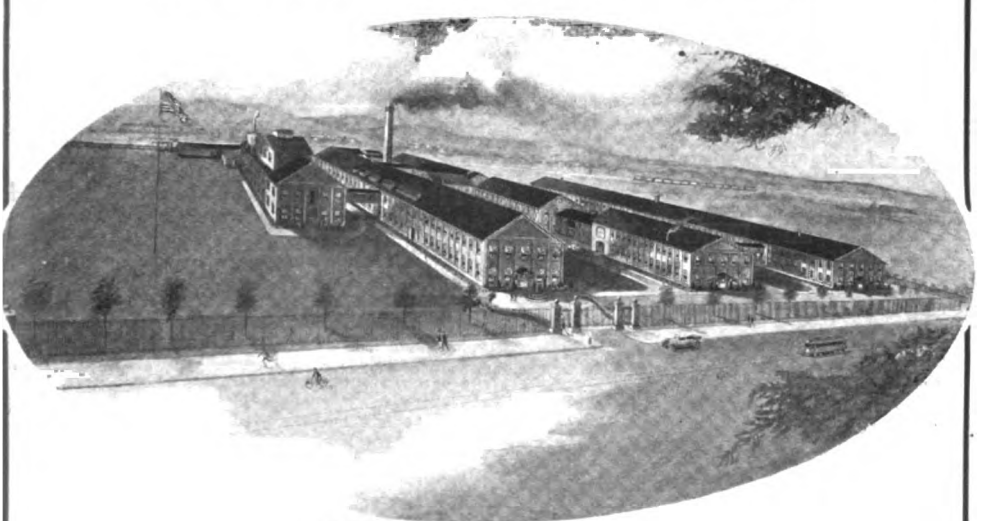
Main Office and Factory: WILLIAMSPORT, PA.

MANUFACTURERS

Flint Paper, Emery Paper, Emery and Crocus Cloth, Garnet Paper, Garnet Cloth, Herculundum and Carbalox Cloth (Artificial Abrasives), Sheets, Rolls and Discs.



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DETROIT.....30-34 Woodbridge Street, East
CHICAGO.....164 N. Wabash Avenue
SAN FRANCISCO.....244 California Street

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TOPS, Special and One-Man, for Fords (Continued)

Detroit Slip Cover Co., 22 Hendrie Ave., Detroit, Mich.

Detroit Weatherproof Body Co., 600 S. Saginaw St., Pontiac, Mich.

Emerson-Brantingham Implement Co., 1652 N. Iron St., Rockford, Ill.

Fouts & Hunter Carriage Mfg. Co., 135 N. Third St., Terre Haute, Ind. "Cozy Cab."

Gordon Co., J. P., 303 N. Fourth St., Columbus, O. (See page 225.)

Heinzelman Bros. Carriage Co., 115 East B. St., Belleville, Ill. "Koupet."

Holden One-Man Top Co., 1776 Broadway, New York, N. Y.

Horstman Auto Top Co., 1928 Prospect Ave., Cleveland, O.

Koupet—See Heinzelman Bros. Carriage Co.

Miller & Ashe, 114 N. Dexter St., Ionia, Mich. "Daisy."

Omaha Auto Top Co., 709-11 S. 15th St., Omaha, Neb. "Co-Zee."

Parry Mfg. Co., 110 Parry Ave., Indianapolis, Ind.

Perkins-Campbell Co., 634 Broadway, Cincinnati, O. (See page 227.)

Reinert & Co., N. A., 608 S. Dearborn St., Chicago, Ill. "Snug-Tite."

Seaman Co., W. S., 486 Virginia St., Milwaukee, Wis.

Snug-Tite—See Reinert & Co.

Topford—See Detachable Limousine Co.

Unico—See Unit Construction Co.

Warner Auto Top Co., 1622-26 Central Ave., Cincinnati, O.

Western Auto Top Co., 1208-10 Jackson St., Omaha, Neb.

Wheel Top Co., Eighth & Main Sts., Cincinnati, O.

Wilson—See Cincinnati Auto Specialty Co.

TORCHES, Acetylene Brazing and Welding

Davis & Schegg Co., 2122 Broadway, New York, N. Y.

Prest-O-Lite Co., Indianapolis, Ind. (See page 89.)

TORCHES and FURNACES, Gasoline or Kerosene

American Stove Co. (Ringen Div.), 828 Chouteau Ave., St. Louis, Mo.

American Stove Co. (Reliable Stove Co. Div.), E. 40th St. & Penna. R. R., Cleveland, O. "Reliable."

Baby—See McGill Mfg. Co.

Barthel—See Globe Gas Light Co.

Bernz, Otto, 27 Ashland St., Newark, N. J.

Bolte Mfg. Co., 125-27 S. Racine Ave., Chicago, Ill.

Carleton Co., 170 Summer St., Boston, Mass. "Imp."

Clayton & Lambert Mfg. Co., Detroit, Mich. (See page 743.)

Globe Gas Light Co., 27 Union St., Boston, Mass. "Barthel."

Handy Torch Co., 69 Genesee St., Utica, N. Y.

Hauck Mfg. Co., 140 Livingston St., Brooklyn, N. Y.

Hot Blast—See Turner Brass Works.

Imp—See Carleton Co.

Kwikheet—See Gemco Mfg. Co.

McGill Mfg. Co., 259 Indiana Ave., Valparaiso, Ind. "Baby."

Quadriga Mfg. Co., 213-21 W. Grand Ave., Chicago, Ill. "Walters."

Reliable—See American Stove Co.

Turner Brass Works, Sycamore, Ill. "Hot Blast."

Volcano Torch & Mfg. Co., 237 E. 22d St., Erie, Pa.

Wall Mfg. Supply Co., P., 720 Preble Ave., Pittsburgh, Pa.

Walters—See Quadriga Mfg. Co.

TOTE BOXES—See Boxes, Sheet Metal

TOURING BASKETS—See Hampers, Touring

TOURING TENTS—See Tents, Touring

TOW BARS—See Ropes, Chains and Bars, Tow

TOW CHAINS—See Ropes, Chains and Bars, Tow

TOW HOOKS—See Hooks, Safety Tow

TOW ROPE SHOCK ABSORBERS—See Springs, Tow Rope

TOW ROPE SPRINGS—See Springs, Tow Rope

TOW ROPES—See Ropes, Chains and Bars, Tow

TRACTORS—See Section I

TRAFFIC SIGNALS—See Signals, Direction Indicating or Traffic

TRAILER AXLES—See Axles, Special Trailer

TRAILER CONNECTIONS—See Couplers, Trailer

TRAILER CONNECTORS—See Connectors, Trailer

TRAILER COUPLERS—See Couplers, Trailer

TRAILERS, Automobile and Truck

American Carriage Co., Kalamazoo, Mich.

Arcadia Trailer Corp., Newark, N. Y. (See page 715.)

Auto-Kamp Equipment Co., Saginaw, Mich. "Hitchon."

Automatic Trailer Co., Lapeer, Mich.

Biggam Trailer Corp., Corunna, Mich.

Buob & Scheu, 500-10 Webster St., Cincinnati, O. (See page 711.)

California Trailer & Radiator Co., India & C Sts., San Diego, Cal. "Komfy."

Camp-Mobile—See Cozy Camp & Auto Trailer Co.

Case Trailer Co., J. M., Grand Rapids, Mich.

Cleveland Top & Specialty Co., 3102 Franklin Ave., Cleveland, O.

Columbia Motor Truck & Trailer Co., Pontiac, Mich. (See page 51.)

Columbia Wagon Co., Columbia, Pa.

Cozy Trailer Equipment Co., 46-48 Kentucky Ave., Indianapolis, Ind. "Campmobile."

Curtis Trailer Co., 1411 Hennepin St., Minneapolis, Minn.

Defiance Carriage Co., Defiance, O.

Delker Co., George, Henderson, Ky.

Detroit Trailer Co., 453-65 Stanley Ave., Detroit, Mich. (See page 715.)

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King TRAILER ANN ARBOR MICH.

Use These Catalog Pages to Make Sales

For every line of business King Trailers cut first and upkeep costs. They handle large loading space without the use of "extra men"—this is a big item these days. We can supply King Trailers for immediate shipment. Write or wire us for prices, discounts and nearest distributor.

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King Semi-trailers are used to triple the capacity of present truck equipment. Utmost efficiency is secured by using King semi-trailers in relays—one tractor-truck constantly on the road with one trailer, while at either end of the route other trailers are loading and unloading. King standards and 5th wheel makes this system practical for the first time.

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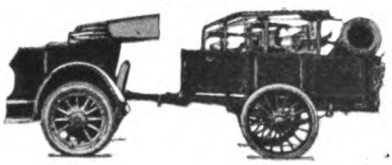
The King pole trailer is essential for hauling long material. It is adjustable from 6 to 18 feet.



King Small Trailers

The King "small trailer" has made it possible to utilize any passenger car as a tractor. King small trailers are made in two capacities: Model A, 1500 lbs. Model B, 1200 lbs., with its ball bearing axles. 7,000 mile guaranteed tires, artillery wheels and the King universal motion, shock-absorbing coupler, puts the King "small trailer" in a class by itself.

King Fifth Wheel

The exclusive shock absorbing universal motion, stabilizing and quick coupling and uncoupling features of the King 5th wheel has solved the big problem of Trailer efficiency.

JOBBING POINTS

Buffalo, N. Y.	Des Moines, Iowa	Los Angeles, Cal.	Portland, Oregon
Chattanooga, Tenn.	Indianapolis, Ind.	New Orleans, La.	Salt Lake City, Utah
Chicago, Ill.	Kansas City, Mo.	New York, N. Y.	San Francisco, Cal.
Columbus, Ohio	Little Rock, Ark.	Philadelphia, Pa.	Seattle, Wash.

KING TRAILER CO., Ann Arbor, Michigan

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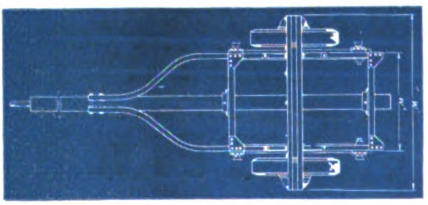
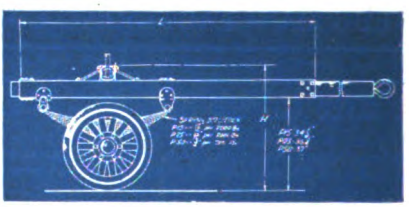
King TRAILER ANN ARBOR MICH.

King Pole and Semi-Trailer Specifications

Capacities refer to axle of trailer, which support 70% of total load. The trailer selected should be rated at two to three times the capacity of the truck to be used as a tractor. Place fifth wheel over or directly in front of truck's rear axle.

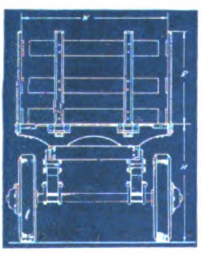
KING POLE TRAILERS

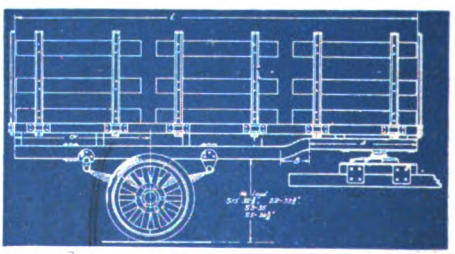




	MODEL P15	MODEL P25	MODEL P50
CAPACITY	1½ TON	3½ TON	5 TON
LENGTH L	9'-0"	9'-8"	9'-9½"
WIDTH W	74½"	68½"	72½"
WIDTH W'	43½"	39½"	39½"
HEIGHT	47"	49"	49"
AXLE (see specification)	2¼" diam.	2⅝" x 2⅝"	2⅝" x 4"
		3" diam.	
TIRES	36" x 4"	36" x 6"	36" x 7"
BEARINGS	Roller	Roller	Roller
FRAME	5" Channel	6" Channel	7" Channel
TREAD	56"	56"	60"
SPRING CENTER	2½" x 40"	3½" x 48"	3½" x 48"
BOLSTER	3½" x 7½" x 60" Hard Wood	3½" x 7½" x 60" Hard Wood	2-5" Channel x 72"
POLE REACH	16' of 3" pipe	16 ft. of 3" pipe	16' of 4" pipe

KING SEMI-TRAILERS





	MODEL S-1.5, 1½ TON	MODEL S-2, 2 TON	MODEL S-3, 3 TON	MODEL S-5, 5 TON
LENGTH L	12'	12'	14'-6"	14'-6"
WIDTH W	5'	5'	5'	6'
HEIGHT H (Free)	46"	47"	47"	50"
OVERHANG O'	4'	4'	4'-9"	4'-9"
RACKS K'	2'-8½"	3'-7"	3'-5½"	3'-5½"
FRAME	4" Channel	4"	5"	6"
A	43"	40"	48"	48"
B	20"	20"	26"	26"
WHEEL BASE	6'-8"	6'-8"	8'-5"	8'-5"
Outside HUB to HUB	68½"	68½"	70½"	70½"
AXLE (see specification)	2¼" diam.	2½" diam.	2½" x 2½"	2½" x 4"
TIRES	34" x 3½"	36" x 4"	36" x 5"	36" x 7"
TREAD	56"	56"	56"	60" unless otherwise specified
SPRING CENTERS	38"	38"	38"	38"
SPRING DEFLECTION	15/16" per 2000 lbs	15/16" per 2000 lbs	15/16" per 2000 lbs	3/4" per 2000 lbs
BEARINGS	ROLLER	ROLLER	ROLLER	ROLLER
Load Distribution	70% on Trailer Axle	70% on Trailer Axle	70% on Trailer Axle	70% on Trailer Axle

KING TRAILER CO., Ann Arbor, Michigan

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WEBB FLEXIBLE SHAFTS

(Pat. May 12, 1908)

MAY BE IMITATED, BUT

NEVER EXCELLED

Because their service and durability are superior for Indicating and Recording Instruments and Mechanical Devices of all description.

WE ALSO MAKE

BUFFING, DRILLING AND GRINDING OUTFITS AND WIRE BELTS

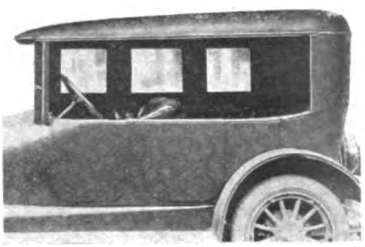
Catalogue on Request

WEBB MANUFACTURING CO., Foot of Centre St., Newark, N. J.

THE ALVEY ALL-YEAR TOP—Write for Price List

Top is convertible from a closed to an open top or vice versa in less than three minutes, without obstruction from wind shield to rear quarter. No tools required.

The curtains are of heavy celluloid which operate like a window shade on rollers between the lining and the roof. The celluloid does not roll, but lies perfectly flat and is protected and out of sight when not in use. For the Ford, Dodge and Overland cars.



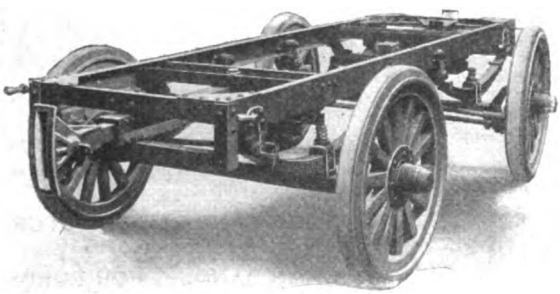
TRADE MARK

Wardway

VEHICLE WORKS

Chicago Heights, ILLINOIS

Mfrs. of Auto Accessories and the U-CAN-AFFORD-TRUCK SPRINGS (See July Edition)



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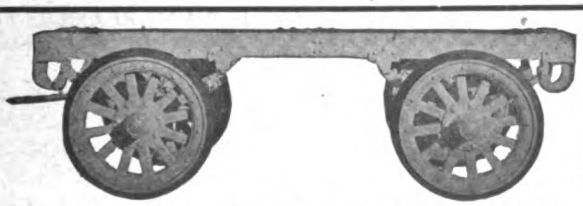
4-Wheel, Reversible Heavy Duty, 2-3½-5 Tons

2-Wheel, 1-Ton, with body adapted to Farm Produce and Factory work

ARCADIA TRAILER CORPORATION, Newark, New York State



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Dealers get our agency proposition.
We have a limited amount of territory still open.

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TRAILERS, Automobile and Truck (Continued)

E-B—See Emerson - Brantingham Implement Co.

Eckhart Carriage Co., Auburn, Ind. "Simplex."

Electric Wheel Co., Walton Heights, Quincy, Ill.

Emerson-Brantingham Implement Co., 1652 N. Iron St., Rockford, Ill. "E-B."

Forsythe Mfg. Co., Third St. & Kentucky Ave., Joplin, Mo. "King Jack."

Fowler's Garage & Machine Works, 1414 Broadway, Seattle, Wash.

Fruehauf Trailer Co., 1371 Gratiot Ave., Detroit, Mich.

Glen Wagon & Car Corporation, Cortland, N. Y.

Harper Buggy Co., Columbia City, Ind.

Hesse & Son Mfg. Co., Wm. G., Leavenworth, Kans.

Hi-Speed Trailer Car Co. (E. Rochester), Rochester, N. Y.

Highway Trailer Co., Edgerton, Wis.

Hitchon—See Auto-Kamp Equipment Co.

Hopp Carriage Co., Mifflinburg, Pa.

Jackson—See Miles Mfg. Co.

King Jack—See Forsythe Mfg. Co.

King Trailer Co., Ann Arbor, Mich. (See pages 714A and 714B.)

Kleiber & Co., 11th & Folsom Sts., San Francisco, Cal.

Knox Motors Co., 53 Wilbraham Rd., Springfield, Mass.

Komfy—See California Trailer & Radiator Co.

Lapeer Tractor Truck Co., Lapeer, Mich.

Laura, John P., 40 S. Monroe St., Coldwater, Mich.

Lee Loader & Body Co., 2343 S. La Salle St., Chicago, Ill.

Lion Buggy Co., Cincinnati, O.

Litehaul—See Puffer-Hubbard Mfg. Co.

Los Angeles Trailer Co., 17th & Main Sts., Los Angeles, Cal.

Lowell Cutter Co., Lowell, Mich.

Martin Rocking Fifth Wheel Co., Springfield, Mass. (See page 759.)

Martin Truck & Body Corp., York, Pa. (See page 117.)

Mayer Co., 539 Orleans St., Chicago, Ill.

Meeker Mfg. Co., Linden & Huffman Aves., Dayton, O. "Trail-O-Car."

Miami Trailer Co., 406 E. Main St., Troy, O.

Michigan Trailer Co., Kalamazoo, Mich.

Mifflinburg Body Co., Mifflinburg, Pa. (See page 117.)

Miles Mfg. Co., Dept. 12, Jackson, Mich. "Jackson." (See page 799.)

Nonpareil Mfg. Co., Cochranton, Pa.

Ohio Trailer Co., Oakview Ave. & Nottingham Rd., Cleveland, O.

Oneida—See Schubert Wagon Co.

Page Bros. Buggy Co., Marshall, Mich.

Parry Mfg. Co., 110 Parry Ave., Indianapolis, Ind.

Press Sons, Jacob, 300 N. Halsted St., Chicago, Ill.

Puffer-Hubbard Mfg. Co., 26th St. & 32d Ave., S., Minneapolis, Minn. "Litehaul."

Randolph, H. C., Jonesville, Mich.

Rogers Bros. Co., Albion, Pa.

Samson Trailer Corp., Grand Rapids, Mich.

Schubert Wagon Co., August, 1-3 S. Warner St., Oneida, N. Y. "Oneida."

Shadbolt Mfg. Co., Flushing Ave. & Cumberland St., Brooklyn, N. Y.

Shaver Auto Trailer Co., E. Third & Locust Sts., Des Moines, Ia.

Simplex—See Eckhart Carriage Co.

Springfield-Commercial Body Co., 367 Worthington St., Springfield, Mass.

Standard Trailer Co., Grant St., Cambridge Springs, Pa.

Stockbridge Body Co., 130 Union St., Springfield, Mass. (See page 643.)

Stunkard Bros. Buggy Co., 24-26 N. Meridian St., Brazil, Ind.

Tacoma Trailer Co., 945 Market St., Tacoma, Wash.

Trail-O-Car—See Meeker Mfg. Co.

Trailer Truck Co., Nashotah, Wis.

Trailmobile Co., 565 E. Fifth St., Cincinnati, O.

Tri Ton Corp., 250 W. 54th St., New York, N. Y.

Troy Wagon Works Co., Troy, O.

Variety Mfg. Co., 340-52 N. Sacramento Bldg., Chicago, Ill.

Victor Motor Truck & Trailer Co., 401 N. Hoyne Ave., Chicago, Ill. (See page 49.)

Victor Safety Trailer, 36-38 Durston Ave., Ossining, N. Y.

Wardway Vehicle Works, Chicago Heights, Ill. (See page 715.)

Warner Mfg. Co., 310 Bushnell Ave., Beloit, Wis.

Watson Wagon Co., 214 W. Center St., Canastota, N. Y.

Whetstone & Co., John H., Lapeer, Mich.

TRANSFERS, Decalcomania

Auto Monogram Supply Co., Niagara Bldg., Newark, N. J.

Meyercord Co., Chamber of Commerce Bldg., Chicago, Ill.

Motorists Accessories Co., 12½ S. Park St., Mansfield, O.

National Decalcomania Co., 238-40 N. 60th St., Philadelphia, Pa.

Palm Bros. Co., 71 Murray St., New York, N. Y.

Palm, Fechteler & Co., 67 Fifth Ave., New York, N. Y.

Smith & Co., Geo. A., 136 Liberty St., New York, N. Y.

TRANSMISSION ASSEMBLY CLAMPS—See Clamps, Transmission Band Assembling

TRANSMISSION BAND LUGS FOR FORDS—See Lugs, Transmission Band

TRANSMISSION BANDING FOR FORDS—See Lining, Brake

TRANSMISSION BANDS FOR FORDS—See Bands, Transmission

TRANSMISSION BUSHING REAMERS FOR FORDS—See Reamers, Transmission Bushing

TRANSMISSION FACINGS—See Lining, Brake

TRANSMISSION GEAR BUSHINGS—See Bushings, Bronze

TRANSMISSION GEARS—See Gears, Transmission

TRANSMISSIONS—See Gears, Transmission

TRANSMISSIONS, AUTOMATIC STARTER—See Gears, Automatic Starter Transmission

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Asbestos Protected

TIRES

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This is an exclusive feature of

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Remember Perfection Tires are sold under a 6,000 mile guarantee.

We have an interesting selling proposition that we will gladly send you upon request —write for it *today*.

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It is guaranteed for 6000 miles on commercial cars.

And is guaranteed for 8000 miles on passenger cars.

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This shows the UNIVERSAL APPRECIATION of OUR TIRE and it should convince you of its SUPREME MERIT.

The sale of one of our tires to your customer compels his permanent patronage.

Write for Dealers' Proposition.
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TRANSMISSIONS, TRACTOR—See Gears, Tractor Transmission

TRANSMITTING ATTACHMENTS—See Attachments, Power Transmitting

TREAD STITCHING MACHINES—See Machines, Double Tread Tire Stitching

TREADS or PROTECTORS, Detachable Tire

A. S. B.—See Queen Mfg. Co.
Brictson Mfg. Co., W. O. W. Bldg., Omaha, Neb.
Bukolt Mfg. Co., Stevens Point, Wis. "Highway."
Durable—See Gates Rubber Co.
Ever Last Tread Co., 128 E. New York St., Indianapolis, Ind.
Gates Rubber Co., Denver, Colo. "Durable."
Highway—See Bukolt Mfg. Co.
International Rubber Co., Denver, Colo.
Invincible—See Sturges Co.
Kimball Tire Case Co., 163 Broadway, Council Bluffs, Ia.
King Tire Protector Co., Matthews Bldg., Milwaukee, Wis.
Maplebay Mfg. Co., Crookston, Minn.
Miller, Chas. E., 1400 S. Meridian St., Anderson, Ind.
National Consolidated Rubber Co., 207-15 Second St., San Francisco, Cal.
Pacific—See Sturges Co.
Queen Mfg. Co., Webster City, Ia. "A. S. B."
Sturges Co., V. K., 26th & Union Sts., Oakland, Cal. "Invincible," "Pacific," "Zig-Zag."
Triple Tread Tire Co., 1442 Michigan Ave., Chicago, Ill.
Universal Tire Protector Co., Angola, Ind.
Wearproof Tire Products Co., 554 Van Ness Ave., San Francisco, Cal.
Woodworth Mfg. Co., Niagara Falls N. Y. (See page 721.)
X X X Auto Accessory Co., Springfield, Mass.
Zig Zag—See Sturges Co.

TREATING COMPOUNDS—See Compounds, Gasoline Treating

TREATING, Heat

American Chain Co., Bridgeport, Conn. (See page 369.)
American Metal Treatment Co., Elizabeth, N. J. (See page 207.)
Bidle Co., W. S., 1411 E. 45th St., Cleveland, O.
Meisel Press Mfg. Co., 945 Dorchester Ave., Boston, Mass. (See page 319.)
Milwaukee Heat Treating Co., 651-53 S. Pierce St., Milwaukee, Wis.
Modern Steel Treating Co., 220 Becher St., Milwaukee, Wis.
Peninsular Milled Screw Co., 1090 Lafayette St., E., Detroit, Mich.
Perry-Fay Mfg. Co., Elyria, O.
Steel Improvement & Forge Co., 5003 Windsor Ave., Cleveland, O.
Scott, C. U., head of Wall St., Davenport, Ia.
Vincent Steel Process Co., 751 Bellevue Ave., Detroit, Mich.
Wesley Steel Treating Co., 651-53 S. Pierce St., Milwaukee, Wis.
Williams & Co., J. H., 38 Richards St., Brooklyn, N. Y. (See page 433.)
Wyman-Gordon Co., Worcester, Mass. (See Back Bone.)

TRESTLES AND TRUCKS—See Horses, Trestles and Trucks

TRIMMERS' CLIPS—See Clips, Trimmers'

TRIMMERS' PASTE—See Paste, Trimmers'

TRIMMINGS, Cloth and Carpet

(See also Broadcloth, also Buttons; also Carpet; also Cloth; also Laces; also Linoleum; also Silk; also Whipcord)

Albrecht Co., H. E., 1834 Broadway, New York, N. Y.
Alf Co., Edward F., 420 E. Eighth St., Cincinnati, O.
Barrell Co., Wm. L., New York, N. Y. (See page 393.)
Bridgeport Coach Lace Co., Bridgeport, Conn.
Carr Co., F. S., 31 Beach St., Boston, Mass. (See page 189.)
Chandler Oil Cloth & Buchram Co., East Taunton, Mass.
Chase & Co., L. C., Boston, Mass. (See page 497.)
Duncan Co., W. H., 58-60 Worth St., New York, N. Y.
Dusenbury & Co., Louis, 229-33 Fourth Ave., New York, N. Y.
Galland, Wechmar & Co., 456 Fourth Ave., New York, N. Y.
Gerhab, Jacob, 158-64 N. Third St., Philadelphia, Pa.
Gifford & Son, John A., 25 Park Pl., New York, N. Y.
Haartz, J. C., 10 High St., Boston, Mass.
Hoof Co., C. M., 317 W. Randolph St., Chicago, Ill. (See page 671.)
Kennedy, Willing & Co., 526 Arch St., Philadelphia, Pa.
Laidlaw Co., 16 W. 60th St., New York, N. Y. (See page 191.)
Landers Bros. Co., Blucher & Buckingham Sts., Toledo, O.
Lounsbery & Sons, G. H., 107-09 W. Third St., Cincinnati, O.
Mossman, Yarnelle & Co., Pearl St. & Maiden Lane, Fort Wayne, Ind.
Patterson & Greenough, 45 E. 17th St., New York, N. Y.
Piet-Robertson-Rainey Co., 108 S. Howard St., Baltimore, Md.
Roehm & Davison, Woodbridge & Wayne Sts., Detroit, Mich.
Rogers & Co., E. F., 410 Arch St., Philadelphia, Pa.
Scherer & Co., H., 280 Jefferson Ave., E., Detroit, Mich.
Schlegel Mfg. Co., College Ave. & N. Goodman St., Rochester, N. Y.
Sherwood, A. S., 258 W. 54th St., New York, N. Y.
Shirley Auto Fabric Co., 250 W. 54th St., New York, N. Y.
Sloane, W. & J., 575 Fifth Ave., New York, N. Y. (See pages 393 and 417.)
Ten Eick, Cornelius, 253 W. 47th St., New York, N. Y.
Thurbis—See Thurnauer & Co.
Thurnauer & Co., J. C., 354 Fourth Ave., New York, N. Y. "Thurbis."
Tiel & Co., Geo., 418 Arch St., Philadelphia, Pa.
Vogt Mfg. & Coach Lace Co., 408-10 St. Paul St., Rochester, N. Y.
Wiese & Co., Wm., 234 W. 56th St., New York, N. Y.
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SEBRING " ..	6,000 "	TRIPLEX "	3,500 "

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HIGH GRADE
TIRES

At Low Prices

JOBBERS NET PRICES

SIZE	TIRES Plain	TIRES Non-Skid	TUBES Gray	TUBES Red
28x3.....	$9.15	$9.60	$2.05	$2.30
30x3.....	8.90	9.30	2.00	2.25
30x3½...	11.50	12.10	2.50	2.75
32x2½...	13.50	14.20	2.60	2.85
31x4.....	17.70	18.50	3.15	3.55
32x4.....	18.00	18.90	3.25	3.65
33x4.....	18.90	19.75	3.35	3.75
34x4.....	19.20	20.25	3.45	3.85

All other sizes in stock.

At these prices we deliver first tires bearing name and serial number of the manufacturers (not seconds).

Our volume of Repeat orders has been so great that we can confidently say that our tires are giving exceptional service, and a trial order will convince you that we offer you more tire for your dollar than you have ever received.

Send us a trial order and we will ship C. O. D. by express the same day order is received.

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VARIOUS MAKES

GUARANTEED 4,000 MILES

We Pay Express Charges — **Prompt Shipment**

If a Tire fails to run 4,000 miles, we will replace it with another tire for one-half price marked below.

Size	Plain	Non-Skid	Tubes
28x3.....	$6.95	$7.95	$1.95
30x3.....	7.95	8.45	2.05
30x3½.....	11.30	11.95	2.25
31x3½.....	11.95	12.95	2.30
32x3½.....	12.95	13.95	2.40
34x3½.....	14.45	14.95	2.50
31x4.....	16.45	17.45	3.15
32x4.....	16.95	17.95	3.20
33x4.....	17.25	18.45	3.25
34x4.....	17.95	18.95	3.35
35x4.....	18.45	19.45	3.40
36x4.....	18.95	19.95	3.50
34x4½.....	22.95	23.95	4.15
35x4½.....	23.60	24.70	4.25
36x4½.....	23.95	24.95	4.30
37x4½.....	24.95	25.95	4.40
35x5.....	26.25	27.25	5.00
37x5.....	27.95	28.95	5.20

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NEW YORK: 1789 Broadway, Cor. 58th St.
PHILADELPHIA - 612-614 N. Broad St.

Big Mileage *and* Low Prices

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DEALERS: This is your opportunity Montford tires offer the dealer a rare opportunity to make ample profit and secure permanent customers—because they possess all the good qualities of the best tires made and yet sell at a price that appeals to the majority of motor car owners.

Write us today for our terms to dealers and price list of Montford Tires.

MONTFORD RUBBER CO., Buffalo, N. Y.

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TRIMMINGS, Metal

(See also Fasteners, Curtain; also Fittings, Top; also Forgings, Drop; also Handles, Door; also Hinges, Door; also Locks, Door; also Irons, Slat; also Irons, Top; also Mouldings, Brass; also Rests, Bow; also Separators, Bow)

Amesbury Brass & Foundry Co., Amesbury, Mass.
Attwood Brass Works, Grand Rapids, Mich. (See page 531.)
Chicago-Racine Aluminum Brass & Iron Works, 224-30 W. Huron St., Chicago, Ill.
Cowles & Co., C., New Haven, Conn. (See page 339.)
Douglas & Lomason Co., 642 Lincoln Ave., Detroit, Mich.
English & Mersick Co., New Haven, Conn. (See page 573.)
Enterprise Brass & Plating Co., Sixth & Raymiller Sts., Cincinnati, O.
Hoof Co., C. M., 317 W. Randolph St., Chicago, Ill. (See page 671.)
Imperial Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill. (See page 733.)
Metal Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.
Monarch Carriage Goods Co., 2838-44 Spring Grove Ave., Cincinnati, O.
Phoenix Lock Works, 321-27 Third Ave., Newark, N. J.
Rogers & Co., E. F., 410 Arch St., Philadelphia, Pa.
Sherwood, A. S., 258 W. 54th St., New York, N. Y.
Smith & Co., Jos. N., E. Grand Blvd. & Dubois St., Detroit, Mich.
Taylor Co., H. D., 101-05 Oak St., Buffalo, N. Y.
Western Brass Mfg. Works, Marshall Blvd., 21st St. & C., B. & Q. R. R., Chicago, Ill.
White Mfg. Co., 155 Cannon St., Bridgeport, Conn.
Wing Co., Charles, Amesbury, Mass. (See page 645.)
Woodruff & Sons Co., Walter W., Mount Carmel, Conn.

TROUBLE CHARTS—See Charts, Electrical Trouble

TRUCK ATTACHMENTS—See Converters, Chassis

TRUCK BODY HOISTS—See Hoists, Truck Body

TRUCK CONVERTERS—See Converters, Chassis

TRUCK FENDERS—See Fenders or Guards, Truck Radiator

TRUCK GUARDS—See Fenders or Guards, Truck Radiator.

TRUCK LOAD INDICATING METERS—See Meters, Truck Load Indicating

TRUCK LOADERS—See Loaders, Truck

TRUCK STAKE POCKETS—See Pockets, Truck Stake

TRUCK STAKE SOCKETS—See Pockets, Truck Stake

TRUCK UNITS—See Converters, Chassis

TRUCK WINCHES—See Winches, Truck

TRUCKS, Body Handling

Equipment Mfg. Co., Warren, O. "Farmington."
Farmington—See Equipment Mfg. Co.

TRUCKS, CASTORS and SPARE WHEELS, Wrecking

(For towing in cars with damaged wheels or axles)

Bihler, Albert E., 1114-18 Dodge St., Omaha, Neb.
Compo Mfg. Co., Defiance, O.
E. & S.—See Ellis-Smith Mfg. Co.
Ellis-Smith Mfg. Co., 216 Niagara St., Buffalo, N. Y. "E. & S."
Guss Co., O. G., Delphos, O.
Holmes & Bros., Robt., 30 N. Hazel Ave., Danville, Ill.
Lawson—See Menasha Wood Split Pulley Co.
Masco—See Milwaukee Auto Specialty Co.
Menasha Wood Split Pulley Co., Menasha, Wis. "Lawson."
Milwaukee Auto Specialty Co., 705-15 Chestnut St., Milwaukee, Wis. "Masco."
Projecta Co., East Milton, Mass.
Weaver Mfg. Co., 2173 S. Ninth St., Springfield, Ill.

TRUCKS, GARAGE WHEEL—See Casters and Wheels Trucks

TRUCKS, Oxygen Tank

Dayton Display Fixture & Novelty Co., 712-14 E. Monument Ave., Dayton, O.

TRUCKS, Repair

(For lying on when making repairs underneath a car)

Automobile Accessories Co., 824 W. ..orth Ave., Baltimore, Md. "Norwood."
Badger Mfg. Corp., Milwaukee, Wis. (See page 139.)
Brown Co., 213 Bellevue Ave., Syracuse, N. Y.
Continental Auto Parts Co., Knightstown, Ind.
E-Z—See Wagner Mfg. Co.
E-Z Roller—See Rice & Dayton Mfg. Co.
Faw, J. H., 37 Warren St., New York, N. Y. "Fawsco." (See page 387.)
Fawsco—See Faw, J. H.
Foster Bros. Mfg. Co., 811 Broad St., Utica, N. Y.
French, F. A., Braddock Ave. & Guthrie St., Pittsburgh, Pa. "Getunder."
Gem—See Moeschl-Edwards Corrugating Co.
Getunder—See French, F. A.
Ideal—See Lewis-Geer Mfg. Co.
Keystone Wire Matting Co., Beaver Falls, Pa
Kund & Erben Mfg. Co., Warrington Ave., Pittsburgh, Pa.
Lewis-Geer Mfg. Co., Ypsilanti, Mich. "Ideal."
Macon Machine Co., 110 S. Rubey St., Macon, Mo.
Masco—See Milwaukee Auto Specialty Co.
Mazura Mfg. Co., 414 S. Sixth St., St. Louis, Mo.
Milwaukee Auto Specialty Co., 705-15 Chestnut St., Milwaukee, Wis. "Masco."
Moeschl-Edwards Corrugating Co., Eighth & Ninth Sts., Covington, Ky. "Gem."
Norwood—See Automobile Accessories Co.
Portland Garage Co., 49-51 Cross St., Portland, Me.
Rice & Dayton Mfg. Co., 115-19 E. Fourth St., Cedar Falls, Ia. "E-Z Roller."
Springville Wood Specialty Co., Springville, N. Y.
Wagner Mfg. Co., Cedar Rapids, Ia. "E-Z."

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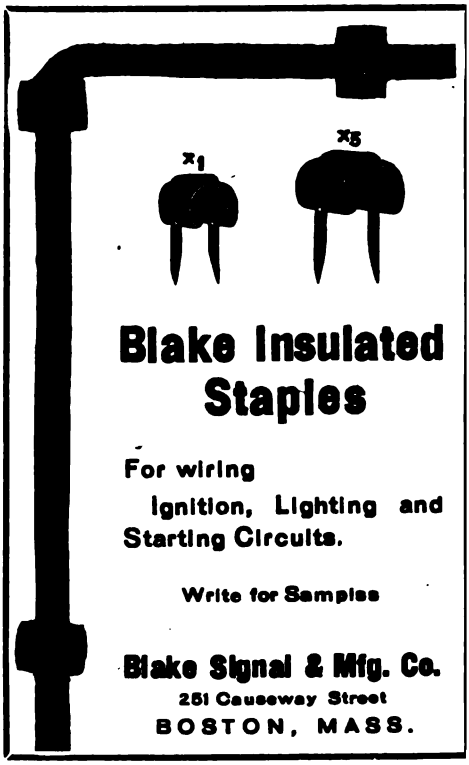

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TRUNK RACKS—See Racks, Trunk

TRUNK STRAPS—See Straps, Leather

TRUNKS, BOARD—See Trunks, Leather

TRUNKS, FABRIC—See Trunks, Leather

TRUNKS, Leather, Fabric and Board

Ajax Trunk & Sample Case Co., 144-50 W. 18th St., New York, N. Y.

Atco—See Auto Trunk & Acme Suit Case Mfg. Co.

Auto Trunk & Acme Suit Case Mfg. Co., 135 Spring St., New York, N. Y. "Atco."

Bailey Co., R. B., 1316 S. Grand Ave., Los Angeles, Cal.

Belber Trunk & Bag Co., 1641 N. Hancock St., Philadelphia, Pa.

Berg Auto Trunk & Specialty Co., 400 Lafayette St., New York, N. Y.

Boyle & Co., John, 112-14 Duane St., New York, N. Y.

Duplex—See Planet Co.

Farmers Market Co., 711 Orange St., Wilmington, Del.

Fitzgerald Trunk Co., 1214 Wells St., Chicago, Ill.

King, W. A., 52 Public Sq., Cleveland, O.

Kronauer & Co., Chas., 152 N. Desplaines St., Chicago, Ill.

Likly & Rockett Trunk Co., 1365 Euclid Ave., Cleveland, O.

McDonald, Alexander, 15 Beacon St., Boston, Mass.

McKane-Lins Co., 81 Wisconsin St., Milwaukee, Wis.

Planet Co., 180 N. Elm St., Westfield, Mass. "Duplex."

Sage's Trunk & Leather Goods Co., 134 Summer St., Boston, Mass.

Simon & Co., S. C., 404-12 Brown St., Philadelphia, Pa.

Stallman, F. A., 57 E. Spring St., Columbus, O.

Taylor Trunk Works, C. A., 678 N. Halsted St., Chicago, Ill.

Tuttle & Clark, Jefferson & Bates Sts., Detroit, Mich.

United Auto Trunk Co., W. 26th St., New York, N. Y.

Winship, W. W., 71 Summer St., Boston, Mass.

TRUNKS, Metal

A. Z. Co., 530 W. 56th St., New York, N. Y. (See page 563.)

National Enameling & Stamping Co., 413 Fifth Ave., New York, N. Y. "Nesco."

Nesco—See National Enameling & Stamping Co.

Warnock & Co., Wm., Sioux City, Ia.

TRUNKS, TIRE—See Trunks, Leather; also Trunks, Metal

TRUSSES, REAR AXLE, FOR FORDS—See Rods, Rear Axle Truss

TRUSS RODS FOR FORDS—See Rods, Rear Axle Truss

TUBE BAGS—See Covers, Spare Tire

TUBE CASES—See Cases, Tire

TUBE EXPANDERS—See Expanders, Boiler

TUBE MANDRELS—See Mandrels, Inner Tube

TUBE TESTING TANKS—See Tanks, Inner Tube Testing

TUBES, Inner

(For Complete Tires—See Tires, Pneumatic)

Acme Rubber Mfg. Co., E. State St., Trenton, N. J.

Akron-Bitwell Tire & Rubber Co., Akron, O (See page 863)

Amazon Rubber Co., E. Market St., Akron, O.

American Auto Accessories Co., 332 S. Michigan Ave., Chicago, Ill. "Brown."

American Rubber Corp., 1974 Broadway, New York, N. Y. "Arrow."

American Rubber & Tire Co., 100 Beech St., Akron, O.

Archer Cord Tire & Rubber Co., 711-17 15th Ave., N. E., Minneapolis, Minn.

Armstrong Rubber Co., 118-22 Adams St., Newark, N. J.

Arrow—See American Rubber Corp.

Auto Tire Sales Co., 1346-48 Michigan Ave., Chicago, Ill. "Lyon." (See page 773.)

Beacon Tire Co., Beacon, N. Y.

Belle City—See Chicago Rubber Clothing Co.

Bergougnan Tire Corp., 49 W. 64th St., New York, N. Y. (Importers.)

Boone Tire & Rubber Co., Chippewa Falls, Wis.

Bowers Rubber Works, 68-70 Sacramento St., San Francisco, Cal.

Bowling Green Rubber Co., 1202 Prospect Ave., Toledo, O.

Braender Rubber & Tire Co., Rutherford, N. J. (See page 723.)

Brown—See American Auto Accessories Co.

Brunswick-Balke-Collender Co., 623-33 S. Wabash Ave., Chicago, Ill. (See page 705.)

Bucyrus Rubber Co., Bucyrus, O.

California—See Hendrie Rubber Co.

Century-Plainfield Tire Co., Plainfield, N. J. (See page 709.)

Century Rubber Works, 1346 Rawson St., Chicago, Ill.

Chester Rubber Tire & Tube Co., Chester, W. Va.

Chicago Rubber Clothing Co., Albert St. & Northwestern Tracks, Racine, Wis. "Belle City."

Combination Rubber Mfg. Co., Bloomfield, N. J.

Community Rubber Co., Morrisville, Pa.

Congress—See McGraw Tire & Rubber Co.

Continental Rubber Works, 1902 Liberty St., Erie, Pa. "Vitalic."

Converse Rubber Shoe Co., Malden, Mass. "Tuff-E-Nuff."

Cortland Tire & Rubber Co., 342 Cortland St., Belleville, N. J.

Crown Tire & Rubber Co., Ralston, Neb.

Cupples Co., Seventh & Spruce Sts., St. Louis, Mo. "Rhinos."

Curtis Tire & Rubber Co., Muskegon, Mich.

Dayton Rubber Mfg. Co., 2346 Kiser St., Dayton, O.

De Luxe—See Thermoid Rubber Co.

Doss Rubber & Tube Co., Candler Bldg., Atlanta, Ga.

Double Fabric Tire Co., 60 W. Ninth St., Auburn, Ind.

Dowse Rubber Co., 122 S. Michigan Ave., Chicago, Ill.

Dujardin Rubber Co., 1675 Broadway, New York, N. Y.

Dural Rubber Corp., Maple Ave., Flemington, N. J.

East Palestine Rubber Co., East Palestine, O.

Ehman Tire & Rubber Co., 27th & La Salle Sts., Chicago, Ill.

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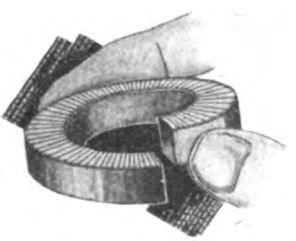

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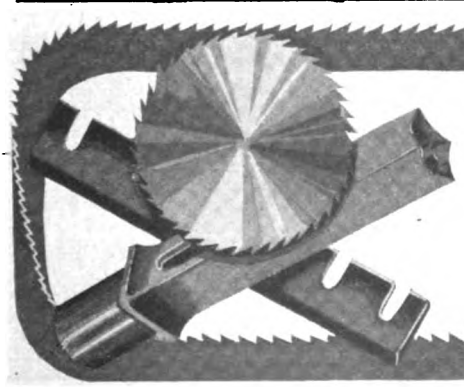

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Endurance Tire & Rubber Co., New Brunswick, N. J.
Eureka Tire Co., Trenton, N. J.
Evergreen—See Falls Rubber Co.
Excel Rubber Co., Wadsworth, O. "X-L."
Falls Rubber Co., Cuyahoga Falls, O. "Evergreen."
Federal Rubber Co. (Cudahy), Milwaukee, Wis.
Firestone Tire & Rubber Co., Miller & Sweitzer Aves., Akron, O.
Fisk Rubber Co. of New York, Chicopee Falls, Mass. (See page 709.)
Gillette Rubber Co., Eau Claire, Wis.
Globe Rubber Tire Mfg. Co., Trenton, N .J.
Goodrich Co., B. F., S. Main St., Akron, O.
Goodyear Tire & Rubber Co., Akron, O. (See page 861.)
Gordon Tire & Rubber Co., Seventh & B. & O. R. R., Canton, O.
Greensburg Tire & Rubber Co., Greensburg, Pa. "Isbest," "Pyramid," "Red Wing," "Silver Grey."
Grypon Rubber & Tire Co., Bailey Ave. & 192d St., New York, N. Y.
Hamilton Rubber Mfg. Co., Mead & Prince Sts., Trenton, N. J. "Perfection."
Hanes Rubber Co., Winston-Salem, N. C.
Hardman Rubber Corp. Belleville, N. J (See page 867.)
Hawkeye Tire & Rubber Co., 215 E. Third St., Des Moines, Ia.
Hendrie Rubber Co., W. C., Torrance, Cal. "California."
Home Tire Co., Trenton, N. J.
Hood Tire Co., Watertown, Mass. (See pages 693 and 694.)
Howe Rubber Co., New Brunswick, N. J.
Ideal—See Voorhees Rubber Mfg. Co.
Imperial—See McGraw Tire & Rubber Co.
India Tire & Rubber Co., Akron, O.
Indiana Rubber & Insulated Wire Co., Jonesboro, Ind.
International India Rubber Corp., Ewing Ave. & Vandalia R. R., South Bend, Ind.
Isbest—See Greensburg Tire & Rubber Co.
J. & D. Tire & Rubber Co., Charlotte, N. C.
Jandorf Auto Co., 1763 Broadway, New York, N. Y. (Dealers.) (See page 725.)
Johnstone Tire & Rubber Co., Peoples Gas Bldg., Chicago, Ill. (See page 297.)
Kansas City Tire & Rubber Corp., Kansas City, Mo.
Keystone Rubber Mfg. Co., Erie, Pa.
Kimball Tire & Rubber Co., Dept. C, 1469 Michigan Ave., Chicago, Ill. (See page 709.)
Kokomo Rubber Co., 1042 S. Main St., Kokomo, Ind.
L. & M. Rubber Co., Carrollton, O.
Lancaster Tire & Rubber Co., Columbus, O. (See page 717.)
Last-Wel—See Twin Tube & Rubber Co.
Lee Tire & Rubber Co., 245 W. 55th St., New York, N. Y. "Velvet."
Lincoln Highway Tire Co., Fulton, Ill.
Long-Wear Rubber Co., 9-11 East Ave., Elyria, O.
Lyon—See Auto Tire Sales Co.
McAllister, Frank, 1761 Broadway, New York, N. Y. (Dealers.) (See page 701.)
McGraw Tire & Rubber Co., East Palestine, O. "Imperial," "Congress," "Pullman."
McLean Tire & Rubber Co., East Liverpool, O.
Mansfield Tire & Rubber Co., Newman St., Mansfield, O.
Marathon Tire & Rubber Co., Cuyahoga Falls, O.
Marion Tire & Rubber Co., Marion, O.
Martin, James, 106 W. 52nd St., New York, N. Y. (Dealers.) (See page 719.)
Mason Tire & Rubber Co., Kent, O.
Mattson Rubber Co., Lodi, N. J.
Mercury Tire Co., 1789 Broadway, New York, N. Y. (Dealers.) (See page 719.)
Michelin Tire Co., Milltown, N. J.
Miller, Chas. E., 1400 S. Meridian St., Anderson, Ind.
Miller Rubber Co., Dept. A 43, Akron, O. (See page 705.)
Mohawk Rubber Co., E. Market St., Akron, O.
Monarch—See Perfection Tube Co.
Montford Rubber Co., Buffalo, N. Y. "Red Racer." (See page 719.)
Mutual Tire & Rubber Co , 9 E. 40th St., New York, N. Y.
Nassau—See Thermoid Rubber Co.
National Rubber Co., Pottstown, Pa.
National Tire Co., Broad St. Bank Bldg., Trenton, N. J.
National Tire & Rubber Co., East Palestine, O. "Paragon."
New Jersey Car Spring & Rubber Co., Wayne & Brunswick Sts., Jersey City, N. J.
Norwalk Tire & Rubber Co., Norwalk, Conn.
Nugum—See Sussex Rubber Co.
O. K.—See Oliver Rubber Mfg. Co.
Odell Rubber Co., George, South Bend, Ind.
Oliver Rubber Mfg. Co., 2203 Broadway, Oakland, Cal. "O. K."
Packard—See Pharis Tire & Rubber Co.
Palmer Tire & Rubber Co., St. Joseph, Mich.
Paragon—See National Tire & Rubber Co.
Paramount Tire & Rubber Co., 1834 Broadway, New York, N. Y. (Dealers.) (See page 719.)
Peerless Puncture-Proof Tube Co., 3030 McGee Traffic Way, Kansas City, Mo.
Pennsylvania Rubber Co., Jeannette, Pa.
Perfection—See Hamilton Rubber Mfg. Co.
Perfection Tube Co., Painesville, O. "Monarch."
Pharis Tire & Rubber Co., Newark, O. "Packard." (See page 717.)
Plexus Tire & Rubber Co., State Rd. & Levick St. (Tacony), Philadelphia, Pa.
Portage Rubber Co., Barberton, O.
Porter Rubber Co., News Bldg., Salem, O.
Pullman—See McGraw Tire & Rubber Co.
Pyramid—See Greensburg Tire & Rubber Co.
Quaker City Rubber Co., 629 Market St., Philadelphia, Pa.
Quality Tire & Rubber Co., 1467 Michigan Ave., Chicago, Ill.
Racine Auto Tire Co., State St., Racine, Wis
Racine Rubber Co., Racine, Wis.
Red Racer—See Montford Rubber Co.
Red Wing—See Greensburg Tire & Rubber Co.
Reliance Air Container Co., 603 Boylston St., Boston, Mass.
Republic Rubber Co., Youngstown, O.
Rhinos—See Cupples Co.
Rubber Products Co., Barberton, O. "Stronghold."
Savage Tire Co., Main & Sicard Sts., San Diego, Cal.
Schavoir Rubber Co., 66 Warren St., Stamford, Conn.
Seamless Rubber Co., 534 Congress Ave., New Haven, Conn.
Security Tire & Rubber Co., 840 Huron Rd., Cleveland, O.

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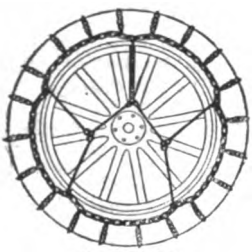

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TUBES, Inner (Continued)

Sedrala—See Semple Rubber Co.
Semco—See Semple Rubber Co.
Semple Rubber Co., 112 Murray St., Trenton, N. J. "Sedrala," "Semco."
Silver Grey—See Greensburg Tire & Rubber Co.
Standard Four Tire Co., 32d St. & Jackson Ave., Keokuk, Ia.
Standard Tire & Rubber Mfg. Co., Willoughby, O.
Star Rubber Co., 1072 Crozier St., Akron, O.
Sterling Tire Corp., Rutherford, N. J.
Stronghold—See Rubber Products Co.
Sussex Rubber Co., Paterson Ave., Rutherford, N. J. "Nugum."
Swinehart Tire & Rubber Co., North & Howard Sts., Akron, O.
Ten Broeck Tyre Co., Dept. A., Louisville, Ky. (See page 705.)
Thermoid Rubber Co., Trenton, N. J. "De Luxe," "Nassau." (See pages 373 and 397.)
Toliver Tube & Tire Co., 734 14th St., Denver, Colo.
Traveler Tire & Rubber Co., 819 N. Broad St., Philadelphia, Pa.
Triumph Tire & Rubber Co., 1765 Broadway, New York, N. Y.
Tuff-E-Nuff—See Converse Rubber Shoe Co.
Twin Tube & Rubber Co., 1002 S. Michigan Ave., Chicago, Ill. "Last-Wel."
Tyer Rubber Co., Andover, Mass. "Tyrian."
Tyrian—See Tyer Rubber Co.
United States Tire Co., Broadway & 58th St., New York, N. Y. (See page 695.)
Universal Rubber Co., Broad & Wood Sts., Philadelphia, Pa.
Velvet—See Lee Tire & Rubber Co.
Victor Rubber Co., Springfield, O. (See page 697.)
Viking—See Voorhees Rubber Mfg. Co.
Vitalic—See Continental Rubber Works.
Voorhees Rubber Mfg. Co., 18-46 Bostwick Ave., Jersey City, N. J. "Viking," "Ideal."
Vulcan Rubber Co., West Lake Rd., Erie, Pa. "Vulco."
Vulco—See Vulcan Rubber Co.
Wilson Tire & Rubber Co., Harvard Pk., Springfield, Ill.
Woodworth Mfg. Co., Niagara Falls, N. Y. (See page 721.)
X-L—See Excel Rubber Co.
Zee-Zee Rubber Co., Yardville, N. J.

TUBES, MICA—See Mica

TUBES, PORCELAIN—See Porcelain

TUBES, Speaking

(For Limousine Telephones—See Telephones, Limousine; for Annunciators—See Annunciators)

Bridgeport Coach Lace Co., Bridgeport, Conn.
Cowles & Co., C., New Haven, Conn. (See page 339.)
English & Mersick Co., New Haven, Conn. (See page 573.)
Norwalk Mfg. Co. (East Norwalk), Norwalk, Conn.
Perpente Mfg. Co., State & Wall Sts., New Haven, Conn.
Schlegel Mfg. Co., College Ave. & N. Goodman St., Rochester, N. Y.
Taylor Co., H. D., 101-05 Oak St., Buffalo, N. Y.

TUBING, Aluminum

Aluminum Co. of America, Pittsburgh, Pa.
Ivins Tube Works, Elwood, Oak Lane Station, Philadelphia, Pa.

TUBING, Brass and Copper

American Brass Co. (Ansonia Brass & Copper Branch), Ansonia, Conn.
American Brass Co. (Benedict & Burnham Branch), Waterbury, Conn.
American Brass Co. (Coe Brass Branch), Torrington, Conn.
American Brass Co. (Kenosha Branch), Kenosha, Wis.
American Brass Products Co., Woolworth Bldg., New York, N. Y. (Dealers.) (See page 799.)
Baltimore Tube Co., Baltimore, Md.
Bridgeport Brass Co., E. Main St., Bridgeport, Conn.
Chase Rolling Mill Co., Waterbury, Conn.
Cornelis & Gridley, Wolcott St., Waterbury, Conn.
Dallas Brass & Copper Co., Chicago, Ill. (See page 259.)
Detroit Copper & Brass Rolling Mills, Clark Ave. below Wabash R. R., Detroit, Mich.
Erie-Buffalo Tube Co., 18th & Cranberry Sts., Erie, Pa.
French Mfg. Co., 142 Robbins St., Waterbury, Conn.
Ivins Tube Works, Elwood, Oak Lane Station, Philadelphia, Pa.
Mackenzie-Walton Co., Pawtucket, R. I.
Michigan Copper & Brass Co., 1611 Jefferson Ave., W., Detroit, Mich. "Wolverine."
Midwest Brass & Copper Co., 6 Church St., New York, N. Y. (Dealers) (See page 459.)
National Brass & Copper Tube Co., 41 Park Row, New York, N. Y.
National Co., Brown's Rd., Waterbury, Conn.
New Jersey Tube Co., Newark, N. J.
Randolph-Clowes Co., Waterbury, Conn.
Roberts Tube Works, 868 Military Ave., Detroit, Mich.
Rome Brass & Copper Co., Rome, N. Y.
Rome Hollow Wire & Tube Co., Railroad St., Rome, N. Y.
Standard Brass & Copper Tube Co., Woodbridge & Division Sts., New London, Conn.
Uniform Seamless Wire Co., 71 Peck St., Providence, R. I.
United Wire & Supply Co., 109-19 Summer St., Providence, R. I.
Waterbury Mfg. Co., 568 Main St., Waterbury, Conn.
Wells & Co., A. H., Watertown Rd., Waterbury, Conn.
Wolverine—See Michigan Copper & Brass Co.

TUBING, BRASS IRON-LINED—See Tubing, Iron-Lined

TUBING CONNECTIONS — See Unions, Tubing

TUBING, COPPER—See Tubing, Brass and Copper

TUBING, FIBRE—See Fibre, Hard

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TUBING, Flexible Metallic

(For oil or gasoline piping, speedometer shaft covering, wire covering, exhaust piping, carburetor hot air pipes, etc.)

Almond Mfg. Co., T. R., 1 Maple Ave., Ashburnham, Mass.

American Metal Hose Co., 67 Jewelry St., Waterbury, Conn.

American Metal Moulding Co., 141 N. J. Railroad Ave., Newark, N. J.

Atlantic Metal Hose Co., 311 W. 59th St., New York, N. Y. (Dealers.) (See page 361.)

Atlantic Tubing Co., 1756 Cranston St., Providence, R. I.

Auto-Steelflex—See National Metal Molding Co.

Breeze Mfg. Co., 250-52 South St., Newark, N. J.

Chicago Tubing & Braiding Co., 216-24 N. Clinton St., Chicago, Ill.

Coates Clipper Mfg. Co., 237 Chandler St., Worcester, Mass.

Duoflex—See Fischer Spring Co.

Fischer Spring Co., Chas., 88-90 Walker St., New York, N. Y. "Duoflex."

Flexible Armored Hose Co., 752 Main St., Buffalo, N. Y.

Lombardi Motor Car Co., 67-71 Minerva St., Derby, Conn.

Metal Hose & Tubing Co., Raymond & Tillary Sts., Brooklyn, N. Y. "Triplexd." (See page 361.)

National Metal Molding Co., Fulton Bldg., Pittsburgh, Pa. "Auto-Steelflex."

Pennflex—See Pennsylvania Flexible Metallic Tubing Co.

Pennsylvania Flexible Metallic Tubing Co., Broad & Race Sts., Philadelphia, Pa. "Pennflex."

Safety-Armorite Conduit Co., Bailey-Farrell Bldg., Pittsburgh, Pa.

Standard Metal Mfg. Co., 237 Chestnut St., Newark, N. J.

Steelflex—See National Metal Molding Co.

Titeflex Metal Hose Corp., Badger Ave. & Runyon St., Newark, N. J. (See page 727.)

Triplexd—See Metal Hose & Tubing Co.

U. S. Flexible Metallic Tubing Co., Boyd & Omar Sts., Los Angeles, Cal.

Webb Mfg. Co., ft. Center St., Newark, N. J. (See page 715.)

Whalen Co., John, 88 Purchase St., Boston, Mass.

TUBING, HARD RUBBER—See Rubber, Hard

TUBING, Iron-Lined Brass

Phenix Tube Co., 182 N. 11th St., Brooklyn, N. Y.

Rome Mfg. Co., Railroad St., Rome, N. Y.

TUBING, RUBBER—See Tubing, Soft Rubber; also Rubber, Hard

TUBING, Soft Rubber

Acme Rubber Mfg. Co., E. State St., Trenton, N. J.

Atlantic Tubing Co., 1756 Cranston St., Providence, R. I.

Boston Belting Co., 84 Linden Park St., Boston, Mass.

Boston Woven Hose & Rubber Co., 110 Portland St., Cambridge, Mass.

Bowers Rubber Works, 68-70 Sacramento St., San Francisco, Cal.

Canfield Rubber Co., Bridgeport, Conn.

Cincinnati Rubber Mfg. Co., Cincinnati, O. (See page 361.)

Combination Rubber Mfg. Co., Bloomfield, N. J.

Continental Rubber Works, 1902 Liberty St., Erie, Pa. "Vitalic."

Dural Rubber Corp., Maple Ave., Flemington, N. J.

Empire Rubber & Tire Co., Mulberry St. & Clinton Ave., Trenton, N. J.

Essex Rubber Co., Trenton, N. J.

Federal Rubber Co. (Cudahy), Milwaukee, Wis.

Firestone Tire & Rubber Co., Miller & Sweitzer Aves., Akron, O.

Goodrich Co., B. F., S. Main St., Akron, O.

Hamilton Rubber Mfg. Co., Mead & Prince Sts., Trenton, N. J.

Hodgman Rubber Co., 806 Broadway, New York, N. Y.

Indiana Rubber & Insulated Wire Co., Jonesboro, Ind.

Mattson Rubber Co., Lodi, N. J.

Mechanical Rubber Co. 307 W. Randolph St., Chicago, Ill. "Usco."

Mechanical Rubber Co., C. & P. & Nickel Plate R. R., Cleveland, O.

Milford Rubber Works, Milford, Ill.

Miller Rubber Co., Dept. A43, Akron, O. (See page 705.)

National India Rubber Co., Bristol, R. I.

New Jersey Car Spring & Rubber Co., Wayne & Brunswick Sts., Jersey City, N. J.

New York Belting & Packing Co., 91 Chambers St., New York, N. Y.

Norwalk Mfg. Co. (East Norwalk), Norwalk, Conn.

Parker, Stearns & Co., 286 Sheffield Ave., Brooklyn, N. Y.

Pennsylvania Rubber Co., Jeannette, Pa.

Petley Rubber Mfg. Co., 241 Oregon St., Milwaukee, Wis. (See page 453.)

Quaker City Rubber Co., 629 Market St., Philadelphia, Pa.

Seamless Rubber Co., 534 Congress Ave., New Haven, Conn.

Thermoid Rubber Co., Trenton, N. J. (See pages 373 and 397.)

Tyer Rubber Co., Andover, Mass. "Tyrian."

Tyrian—See Tyer Rubber Co.

United States Tire Co., Broadway & 58th St., New York, N. Y. (See page 695.)

Usco—See Mechanical Rubber Co.

Vitalic—See Continental Rubber Works.

Voorhees Rubber Mfg. Co., 18-46 Bostwick Ave., Jersey City, N. J.

TUBING, Steel

American Steel Tube Co., 869 S. Erie St., Toledo, O.

American Tube Co., 37th & Rockwell Sts., Chicago, Ill.

American Tube & Stamping Co., 471 Hancock Ave., Bridgeport, Conn.

Dahlstrom Metallic Door Co., Buffalo & E. Second St., Jamestown, N. Y. (See page 731.)

Delaware Seamless Tube Co., Auburn, Pa.

Detroit Seamless Steel Tubes Co., 841 Jefferson Ave., W., Detroit, Mich.

Elisco—See Elyria Iron & Steel Co.

Elyria Iron & Steel Co., E. 131st St., Cleveland, O. "Elisco." (See page 729.)

Empire Art Metal Co., College Point, N. Y.

Frasse & Co., Peter A., 417-21 Canal St., New York, N. Y. (Eastern Distributors for "Shelby Tubing.") (See page 657.)

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TUBING, Steel (Continued)

Globe Seamless Steel Tubes Co., 122 S. Michigan Ave., Chicago, Ill.
Ivins Tube Works, Elwood, Oak Lane Station. Philadelphia, Pa.
Lawrie Co., Fred'k S., Odd Fellows Bldg., Indianapolis, Ind. (Sales Agents.) (See page 867.)
Maxim Silencer Co., 115 Homestead Ave., Hartford, Conn.
Michigan Steel Tube Products Co., Elmtree Blvd., Detroit, Mich.
Mohegan Tube Co., Scott Ave. & Meserole St., Brooklyn, N. Y.
Morris & Co., E. K., 311-17 W. Second St., Cincinnati, O. (Dealers.) (See page 727.)
National Tube Co., Frick Bldg., Pittsburgh, Pa. "Shelby."
Newark Tube & Metal Works, 560 Ferry St., Newark, N. J.
Ohio Seamless Tube Co., Shelby, O. (See page 731.)
Ohio Steel Products Co., Mineral Ridge, O.
Pittsburgh Steel Products Co., Frick Annex, Pittsburgh, Pa.
Shelby—See National Tube Co.
Standard Steel Tube Co., Toledo, O. (See Inside Front Cover.)
Standard Parts Co., Cleveland, O. "Stanweld." (See pages 408 and 409.)
Stanweld—See Standard Parts Co.
Toledo Steel Tube Co., Toledo, O.
United States Iron & Steel Co., Woolworth Bldg., New York, N. Y. (Dealers.) (See page 799.)
Ward's Sons Co., Edgar T., 44 Farnsworth St., Boston, Mass. (Eastern Distributors for Pittsburgh Tubing.) (See page 727.)

TUBING UNIONS—See Unions, Tubing

TUBULAR BOILERS—See Boilers, Steam

TUBULAR RIVETS—See Rivets, Tubular and Clinch

TUFTING BUTTONS—See Buttons, Upholstery

TUFTING MACHINES—See Machines, Upholstery

TUFTING TWINE—See Twine, Tufting

TUFTING WASHERS—See Washers, Tufting

TURN-BUCKLES, Aeroplane

Aero Mfg. & Accessories Co., 18 Dunham Pl., Brooklyn, N. Y.
Bellanca—See New York & Hagerstown Metal Stamping Co.
D. W. F. Engineering Co., Providence, R. I. "Liberty."
Dayton Metal Products Co., Dayton, O.
Erie Specialty Co., 510 W. 12th St., Erie, Pa.
Liberty—See D. W. Engineering Co.
Morrow—See Willys-Morrow Co.
National Lock Washer Co., 65 Johnson St., Newark, N. J.
New York & Hagerstown Metal Stamping Co., Hagerstown, Md. "Bellanca."
Rogers Construction Co., Gloucester City, N. J.
Saxon Mfg. Co., 1034-40 Grand Ave., Toledo, O.
Standard Screw Co. of Penna., Corry, Pa.
Standard Turnbuckle Co., Corry, Pa.
Steel Products Co., Cleveland, O. (See page 400.)
Willys-Morrow Co., Elmira, N. Y. "Morrow."

TURN-BUCKLES, Wrought

American Forging Co., 2700-98 N. 24th St., Birmingham, Ala.
Cleveland Hardware Co., 4500 Hamilton Ave., Cleveland, O.
Columbus Bolt Works Co., Columbus, O. (See page 187.)
Eberhard Mfg. Co., 2734 Tennyson Rd., Cleveland, O.
Haskell Mfg. Co., Wm. H., 24 Commerce St., Pawtucket, R. I.
Merrill Bros, 3 Arnold St., Maspeth, N. Y.
Michigan Bolt & Nut Co., ft. Meldrum Ave., Detroit, Mich.
New England Bolt & Steel Co., Bowdoin St. (Everett), Boston, Mass.
Pawtucket Mfg. Co., 327 Pine St., Pawtucket, R. I.
Peninsular Milled Screw Co., 1090 Lafayette St., E., Detroit, Mich.
Union Elevator & Machine Co., 227 W. Erie St., Chicago, Ill.
Wilcox, Crittenden & Co., 383 Main St., Middleton, Conn.

TURNTABLES, Automobile

(See also Castors and Wheel Trucks)

Bicycle Step Ladder Co., 6 W. Randolph St., Chicago, Ill. "Murray."
Canton Foundry & Machine Co., Third St. & Savannah Ave., S. E., Canton, O. "Universal."
Craig Engineering Co., 1011 Santa Fe Ave., Los Angeles, Cal.
Ernst's Sons, C. F., 75 Lathrop St., Buffalo, N. Y.
Lansing Co., Lansing, Mich.
Link-Belt Co., 732 Dime Bank Bldg., Detroit, Mich. (See page 171.)
Murray—See Bicycle Step Ladder Co.
Nicols & Bro., George P., Old Colony Bldg., Chicago, Ill.
Perfection—See Zering Mfg. Co.
Portland Garage Co., 49-51 Cross St., Portland, Me.
Rochester Iron Works, Powers Bldg., Rochester, N. Y.
Smith Iron Co., G. W. & F., Gerard St., Boston, Mass.
Turner Machine Co., 28-32 Maple Ave., Danbury, Conn.
United Casting Co., Wilson & Violet Sts., Los Angeles, Cal.
Universal—See Canton Foundry & Machine Co.
Zering Mfg. Co., H., 528-30 Reading Rd., Cincinnati, O. "Perfection."

TURNTABLES, Storage Battery

(To eliminate the lifting of heavy batteries when repairing or overhauling them)

American Bureau of Engineering, 1018 S. Wabash Ave., Chicago, Ill. "Peers." (See page 855.)
Continental Auto Parts Co., Knightstown, Ind.
Peers—See American Bureau of Engineering.

TURRET DRILLS—See Drills, Turret

TURRET LATHES—See Lathes, Turret

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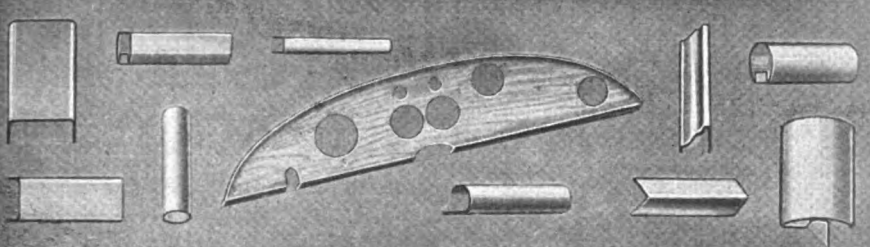

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TWINE, Tufting

Meyer & Co., John C., Lowell, Mass.
Travers Twine & Cordage Co., 81 Warren St., New York, N. Y.

TWIST DRILLS—See Drills, Twist

TWO WAY COCKS—See Valves, Two Way Tank

TWO WAY VALVES—See Valves, Two Way Tank

UNDER BONNET—See Pans, Dust

UNDERWATER EXHAUST BOXES, MOTOR BOAT—See Boxes, Motor Boat Underwater Exhaust

UNIONS, PIPE—See Fittings, Pipe

UNIONS, Tubing

(Compression or solderless and soldering fittings, including unions, tees, ells, etc., for connecting small size brass and copper Tubing—for oil and gasoline lines, etc.)

Commonwealth Brass Corp., Commonwealth Ave. & Grand Trunk Ry., Detroit, Mich.
Crum-Wiley Mfg. Co., Peru, Ind.
Detroit Brass Works, 99 Hobart St., Detroit, Mich.
Detroit Valve & Fittings and Detroit Brass Works, 99 Hobart St., Detroit, Mich.
Dole Valve Co., 208 N. Wells St., Chicago, Ill.
Dohner—See Ohio Metal Products Co.
Edelmann & Co., E., 341-63 E. Ohio St., Chicago, Ill.
Hancock Mfg. Co., 770 Henry St., Charlotte, Mich.
Imperial Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill. (See page 733.)
Lunkenheimer Co., Beekman & Waverly Sts., Cincinnati, O.
McRae & Roberts Co., 211-35 Campbell Ave., Detroit, Mich.
Nelson Mfg. Co., A., 2700 Southport Ave., Chicago, Ill.
Ohio Metal Products Co., 35-39 Edgar St., Dayton, O. "Dohner."
Osborne & Stephenson Mfg. Co., Plainville, Conn.
Powell Co., Wm., 2525 Spring Grove Ave., Cincinnati, O. (See page 195.)
Richardson-Phenix Co., 122-28 Reservoir Ave., Milwaukee, Wis. "Union Cinch."
Roberts Brass Mfg. Co., 1395-1407 Fort St., W., Detroit, Mich.
Union Cinch—See Richardson-Phenix Co.
Western Brass Mfg. Works, Marshall Blvd., 21st St. & C. B. & Q. R. R., Chicago, Ill.
Williams Valve Co., D. T., Spring Grove Ave. & Township St., Cincinnati, O.

UNITS, TRACTOR — See Converters, Chassis

UNITS, TRUCK—See Converters, Chassis

UNIVERSAL GRINDERS—See Grinders, Universal

UNIVERSAL JOINT COVERS—See Boots, Steering Knuckle

UNIVERSAL JOINTS—See Joints, Universal

UPHOLSTERY BINDINGS—See Bindings, Upholstery

UPHOLSTERY BROADCLOTH — See Broadcloth

UPHOLSTERY BUTTON MACHINES—See Machines, Upholstery Button

UPHOLSTERY BUTTONS—See Buttons, Upholstery

UPHOLSTERY CARPET—See Carpet

UPHOLSTERY CLEANERS—See Cleaners, Upholstery

UPHOLSTERY CLOTH—See Cloth; also Broadcloth; also Silk; also Whipcord

UPHOLSTERY DRESSING—See Dressing, Upholstery

UPHOLSTERY FABRICS—See Cloth; also Broadcloth; also Silk; also Whipcord

UPHOLSTERY FELT—See Felt, Upholstery

UPHOLSTERY HAIR—See Hair, Upholstery

UPHOLSTERY LACE—See Lace, Coach

UPHOLSTERY LEATHER—See Leather, Artificial; also Leather, Natural

UPHOLSTERY MACHINES—See Machines, Upholstery

UPHOLSTERY MOSS—See Moss, Upholstery

UPHOLSTERY NAILS—See Tacks, Upholstery

UPHOLSTERY SILK—See Silk, Upholstery

UPHOLSTERY SPRINGS — See Springs, Seat

UPHOLSTERY TACKS—See Tacks, Upholstery

UPHOLSTERY THREAD—See Thread, Upholstery

UPHOLSTERY TUFTING MACHINES—See Machines, Upholstery Tufting

UPHOLSTERY TUFTING WASHERS—See Washers, Tufting

UPHOLSTERY WHIPCORD—See Whipcord

UPRIGHT DRILLS—See Drills, Upright

USED CAR MARKET REPORTS—See Reports, Used Car Market

V BELTS—See Belts, V

VACUUM CLEANERS—See Cleaners, Vacuum

VACUUM GASOLINE TANKS—See Tanks, Vacuum Gasoline

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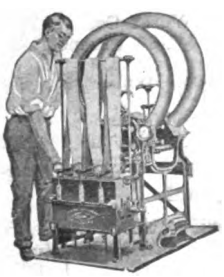

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VACUUM TANKS—See Tanks, Vacuum

VALVE CAP GASKETS — See Gaskets, Metallic

VALVE CAP GASKETS FOR FORDS—See Gaskets, Cylinder Head

VALVE GRINDERS—See Tools, Valve Grinding; also Machines, Valve Seating

VALVE GRINDING COMPOUNDS—See Compounds, Valve Grinding

VALVE GRINDING MACHINES—See Machines, Valve Seating

VALVE GRINDING TOOLS—See Tools, Valve Grinding

VALVE LIFT RODS—See Rods, Adjustable Valve Lift

VALVE LIFTERS—See Tools, Valve Lifting

VALVE PUSH RODS—See Rods, Adjustable Valve Lift

VALVE RESEATERS—See Tools, Valve Reseating

VALVE ROTATORS—See Rotators, Valve

VALVE SEATING MACHINES—See Machines, Valve Seating and Grinding

VALVE SPRING LIFTING TOOLS—See Tools, Valve Spring Lifting and Compressing

VALVE SPRINGS—See Springs, Machinery

VALVE SPRINGS FOR FORDS—See Springs, Engine Valve

VALVE STEM ADJUSTERS—See Adjusters, Valve Stem

VALVE STEM GUIDE REAMERS—See Reamers, Valve Stem Guide

VALVE STEM PINS FOR FORDS—See Pins, Valve Stem

VALVE TAPPETS—See Rods, Adjustable Valve Lift

VALVE TOOLS, TIRE—See Tools, Tire Valve Rethreading

VALVE TURNING TOOLS—See Tools, Valve Seating

VALVES, AUXILIARY AIR—See Mixers, Fuel

VALVES, Ball Check

(Small ball check valves with tubing connections; see also Unions, Tubing)

Crum-Wiley Mfg. Co., Peru, Ind.

Detroit Valve & Fittings and Detroit Brass Works, 99 Hobart St., Detroit, Mich.

Imperial Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill. (See page 733.)

Lunkenheimer Co., Beekman & Tremont Sts., Cincinnati, O.

Williams Valve Co., D. T., Spring Grove Ave. & Township St., Cincinnati, O.

VALVES, CUT-OUT—See Valves, Muffler Cut-Out

VALVES, Engine Check

Monarch Valve Co., 112 Front St., Brooklyn, N. Y.

VALVES, Engine Poppet

(For Valves in the rough—See Forgings, Drop)

Fansteel Products Co., North Chicago, Ill. (See page 737.)

Ford-Clark Co., 3125 Perkins Ave., Cleveland, O.

Lewis Steel Products Co., Toledo, O. (See page 735.)

Michigan Engine Valve Co., 115-17 Columbia St., W., Detroit, Mich. (See page 739.)

Rich Tool Co., Railway Exchange, Chicago, Ill.

Schlieder Mfg. Co., 2628-38 Grand Blvd., E., Detroit, Mich.

Steel Products Co., Cleveland, O. (See page 400.)

VALVES, Engine Poppet, for Fords

Acme Mfg. Co., Boonton, N. J.

Bridgers Co., J. D., Irby & Front Sts., Florence, S. C.

Edelmann & Co., E., 341-63 E. Ohio St., Chicago, Ill.

Ford-Clark Co., 3125 Perkins Ave., Cleveland, O.

Hill-Smith Metal Goods Co., Dept. H, Boston, Mass. (See page 221.)

Illinois Brass Mfg. Co., 236-30 W. Ontario St., Chicago, Ill.

Michigan Engine Valve Co., 115-17 Columbia St., W., Detroit, Mich. (See page 739.)

Morgan Mfg. Co., Keene, N. H.

Nelson Mfg. Co., A., 2700 Southport Ave., Chicago, Ill.

Spencer's Sons, I. S., Guilford, Conn.

Whitehouse-LeCompte Mfg. Co., 42-54 Elm St., Newark, N. J.

VALVES, Gasoline Lock

(Controlling supply of gas to the carbureter; to prevent unauthorized use of car)

Esco Mfg. Co., 23-25 Warren Ave., W., Detroit, Mich.

Gasolock—See Headlight Support Co.

Globe Auto Lock Co., Canisteo, N. Y.

Headlight Support Co., 728 Woodward Ave., Detroit, Mich. "Gasolock."

Hill—See Norwalk Iron Works Co.

McRae & Roberts Co., 211-35 Campbell Ave., Detroit, Mich.

Norwalk Iron Works Co., Water St., South Norwalk, Conn. "Hill."

Pagel—See Turner Brass Works.

Turner Brass Works, Sycamore, Ill. "Pagel."

VALVES, GASOLINE RESERVE—See Valves, Two Way Tank

VALVES, GASOLINE RESERVE, FOR FORDS—See Cocks, Fuel Supply and Reserve

VALVES, MIXING—See Vaporizers

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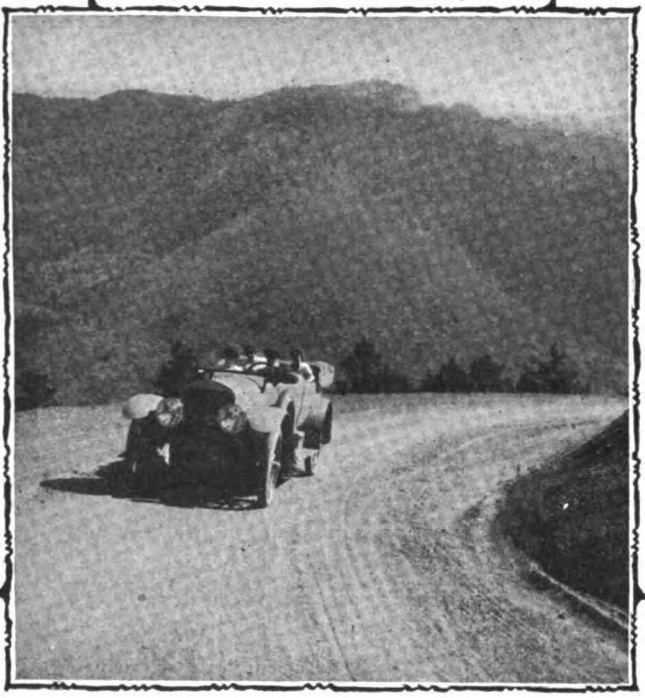

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VALVES, Motor Boat Generator

(For Carbureters—See Carburetors)

Generator Valve Co., 47 Dinsmore Pl., Brooklyn, N. Y.

Lunkenheimer Co., Beekman & Waverly Sts., Cincinnati, O. "Nonpareil."

Monarch Valve Co., 112 Front St., Brooklyn, N. Y.

Nonpareil—See Lunkenheimer Co.

VALVES, Motorcycle Muffler Cut-out

Oldberg Mfg. Co., Detroit, Mich. (See page 471.)

VALVES, Muffler Cut-out

(For cut-out pedals—See Pedals, Horn and Cut-out)

Au-To Compressor Co., Wilmington, O. "Oro."

Barco Mfg. Co., 212-22 W. Illinois St., Chicago, Ill.

Buffalo Pressed Steel Co., Buffalo, N. Y. (See page 473.)

Cassidy Co., Edward A., 280 Madison Ave., New York, N. Y. (Sales Department for G. Piel Co., Long Island City, N. Y.) "G.P." (See page 71.)

Cooper Mfg. Co.—See Fulton Co.

Dunco—See Dunkirk Corp.

Dunkirk Corp., 16 E. Second St., Dunkirk, N. Y. "Dunco."

Empire—See S. B. R. Specialty Co.

Empire Mfg. Co., 51 Le Roy St., Binghamton, N. Y. "Taber." (See page 481.)

Essex—See S. B. R. Specialty Co.

Ewald—See Zinke Co.

Fulton Co., 1910 St. Paul Ave., Milwaukee, Wis. (Sole Distributors for Cooper Mfg. Co., Marshalltown, Ia.) (See page 139.)

G. P.—See Cassidy Co.

Gabriel Mfg. Co., 1407 40th St., N. E., Cleveland, O.

Gemco Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. (See page 135.)

Goodrich-Lenhart Mfg. Co., 429 Widener Bldg., Philadelphia, Pa. (See page 111.)

Gray-Hawley Mfg. Co., 937-43 Jefferson Ave., Detroit, Mich.

Handy—See Lunkenheimer Co.

Husk—See Western Brass Mfg. Works.

Losee, J. S., Hebron, Ill.

Lunkenheimer Co., Beekman & Waverly Sts., Cincinnati, O. "Handy."

Oldberg Mfg. Co., Detroit, Mich. (See page 471.)

Oro—See Au-To Compressor Co.

Perfect—See Riverside Machine Works.

Perfection Machine Co., Jeromeville, O.

Petry Co., N. A., 1309 Race St., Philadelphia, Pa.

Piel Co.—See Cassidy Co.

Powell Muffler & Timer Co., 312-14 Catherine St., Utica, N. Y. (See page 473.)

Riverside Machine Works, 228 Croton Ave., New Castle, Pa. "Perfect."

Romort Mfg. Co.—See Zinke Co.

Rudie—See Western Brass Mfg. Works.

S. B. R. Specialty Co., 17-19 Princeton St., East Orange, N. J. "Essex," "Empire."

Stanhope Forge & Machine Works, 49-51 Lansdowne St., Cambridge, Mass.

Star Brass Works, 2623 McGee Ave., Kansas City, Mo.

Stryker, C. W., 240 Shonnard St., Syracuse, N. Y.

Taber—See Empire Mfg. Co.

Western Brass Mfg. Works, Marshall Blvd., 21st St. & C. B. & Q. R. R., Chicago, Ill. "Rudie," "Husk."

Yankee Co., 69 Genesee St., Utica, N. Y.

Zinke Co., 1323-25 Michigan Ave., Chicago, Ill. (Sole Distributors for Romort Mfg. Co., Oakfield, Wis.) "Ewald." (See pages 548 and 549.)

VALVES, Muffler Cut-Out, for Fords

American Machine Products Co., Marshalltown, Ia. (See page 523.)

Apco Mfg. Co., Eddy St., Providence, R. I.

Au-To Compressor Co., Wilmington, O. "Oro."

Barco Mfg. Co., 212-22 W. Illinois St., Chicago, Ill.

Cassidy Co., Edward A., 280 Madison Ave., New York, N. Y. (Sales Department for G. Piel Co., Long Island City, N. Y.) "G. P." (See page 71.)

Central Foundry Co., Marshalltown, Ia.

Cooper Mfg. Co.—See Fulton Co.

Crum-Wiley Mfg. Co., Peru, Ind.

Empire—See S. B. R. Specialty Co.

Empire Mfg. Co., 51 Le Roy St., Binghamton, N. Y. "Taber." (See page 481.)

Evergood—See Grossman Mfg. Corp.

Ewald—See Zinke Co.

Fulton Co., 1910 St. Paul Ave., Milwaukee, Wis. (Sole Distributors for Cooper Mfg. Co., Marshalltown, Ia.) (See page 139.)

G. P.—See Cassidy Co.

Goodrich-Lenhart Mfg. Co., 429 Widener Bldg., Philadelphia, Pa. (See page 111.)

Gould Mfg. Co., Union Trust Bldg., Cincinnati, O.

Gray-Hawley Mfg. Co., 937-43 Jefferson Ave., Detroit, Mich.

Grossman Mfg. Corp., Emil., Bush Terminal Bldg. No. 20, Brooklyn, N. Y. "Evergood."

Hebert Mfg. Co., Franklin, N. H.

Humboldt Machine & Stamping Co., 81-85 Tenth St., Long Island City, N. Y.

Illinois Brass Mfg. Co., 226-30 W. Ontario St., Chicago, Ill.

Metal Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

Mosco—See Motor Specialties Co.

Motor Specialties Co., Pine St., Waltham, Mass. "Mosco."

Nelson Mfg. Co., A., 2700 Southport Ave., Chicago, Ill.

Oldberg Mfg. Co., Detroit, Mich. (See page 471.)

Oro—See Au-To Compressor Co.

Perkins-Campbell Co., 634 Broadway, Cincinnati, O. (See page 227.)

Petry Co., M. A., 1309 Race St., Philadelphia, Pa.

Piel Co.—See Cassidy Co.

Romort Mfg. Co.—See Zinke Co.

S. B. R. Specialty Co., 17-19 Princeton St., East Orange, N. J. "Empire."

Safety Cut-Out Co., 731 Plymouth Ct., Chicago, Ill. "T. B."

T. B.—See Safety Cut-Out Co.

Taber—See Empire Mfg. Co.

Western Brass Mfg. Works, Marshall Blvd., 21st St. & C., B. & Q. R. R., Chicago, Ill.

Zinke Co., 1323-25 Michigan Ave., Chicago, Ill. (Sole Distributors for Romort Mfg. Co., Oakfield, Wis.) "Ewald." (See pages 548 and 549.)

VALVES, Needle

American Brass & Iron Co., Detroit, Mich. (See page 153.)

Detroit Brass Works, 99 Hobart St., Detroit, Mich.

Detroit Valve & Fittings and Detroit Brass Works, 99 Hobart St., Detroit, Mich.

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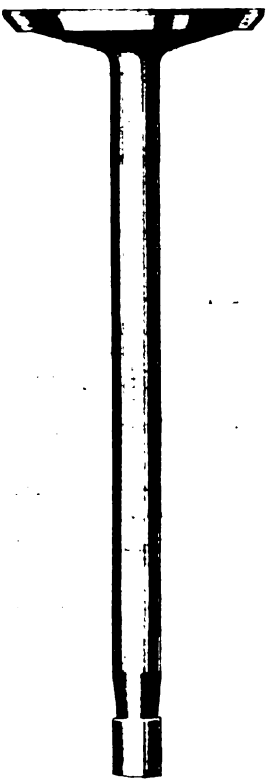

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VALVES, Needle (Continued)

Lunkenheimer Co., Beekman & Waverly Sts., Binghamton, N. Y.

Powell Co., Wm., 2525 Spring Grove Ave., Cincinnati, O. (See page 195.)

Williams Valve Co., D. T., Spring Grove Ave. & Township St., Cincinnati, O.

VALVES, POPPET—See Valves, Engine Poppet

VALVES, PRESSURE REGULATING—See Regulators, Pressure

VALVES, RESERVE—See Valves, Two Way Tank

VALVES, RESERVE, FOR FORDS—See Cocks, Fuel Supply

VALVES, SAFETY—See Valves, Steam Safety; also Valves, Tire Safety

VALVES, Steam Safety

American Steam Gauge & Valve Mfg. Co., 208-20 Camden St., Boston, Mass.

Ashton Valve Co., 271 Franklin St., Boston, Mass.

Star Brass Mfg. Co., 108-14 E. Dedham St., Boston, Mass.

Williams Valve Co., D. T., Spring Grove Ave. & Township St., Cincinnati, O.

VALVES, Steam Throttle

Williams Valve Co., D. T., Spring Grove Ave. & Township St., Cincinnati, O.

VALVES, TANK—See Valves, Two Way Tank; also Cocks, Spring Key; also Cocks, Standard; also Valves, Needle; also Valves, Angle

VALVES, Tire

Atlas Auto Supply Co., 697 W. Austin Ave., Chicago, Ill. "Day." (See page 207.)

Day—See Atlas Auto Supply Co.

Griffin Mfg. Co., 113 State St., Boston, Mass.

Holt Auto Devices Co., Conway Bldg., Chicago, Ill.

Schrader's Son, A., 783-91 Atlantic Ave., Brooklyn, N. Y. (See page 331.)

Standard Tire Valve Co., 233 Broadway, New York, N. Y.

VALVES, Tire Safety

Mizener Supply Co., Decorah, Ia.

VALVES, Two Way Tank

(Fuel Reserve Valves or Cocks)

Breeze Mfg. Co., 250-52 South St., Newark, N. J.

Crum-Wiley Mfg. Co., Peru, Ind.

Hancock Mfg. Co., 770 Henry St., Charlotte, Mich.

Ideal Brass Works, 560 N. Elder Ave., Indianapolis, Ind.

Imperial Brass Mfg. Co., 1234 W. Harrison St., Chicago, Ill. (See page 733.)

Lunkenheimer Co., Beekman & Waverly Sts., Cincinnati, O. "Quadlock."

Quadlock—See Lunkenheimer Co.

Regar Brass Mfg. Co., 1523 E. 45th St., Cleveland, O. (See page 785.)

Roberts Brass Mfg. Co., 1395-1407 Fort St., W., Detroit, Mich.

VALVES, TWO WAY TANK, FOR FORDS See Cocks, Fuel Supply

VANADIUM

American Vanadium Co., Vanadium Bldg., Pittsburgh, Pa.

VANADIUM STEEL—See Steel, Vanadium

VAPOR ENGINE STARTERS—See Starters, Gasoline or Vapor Engine

VAPORIZERS, Motor Boat Kerosene

Olsen—See United States Vaporizer Co.

United States Vaporizer Co., 214 State St., Boston, Mass. "Olsen."

VAPORIZERS or MIXING VALVES, Gasoline

Commonwealth Brass Corp., Commonwealth Ave. & Grand Trunk Ry., Detroit, Mich.

Lunkenheimer Co., Beekman & Waverly Sts., Cincinnati, O. "Nonpareil."

Nonpareil—See Lunkenheimer Co.

Powell Co., Wm., 2525 Spring Grove Ave., Cincinnati, O. (See page 195.)

Wilkinson Co., Wm. H., West Medway, Mass.

Williams Valve Co., D. T., Spring Grove Ave. & Township St., Cincinnati, O.

VARNISH BRUSHES—See Brushes, Paint and Varnish

VARNISH DRYING ROOMS—See Rooms, Paint and Varnish Drying

VARNISH PRESERVATIVES—See Polishes, Automobile Body

VARNISH REMOVERS—See Removers, Paint, Enamel and Varnish

VARNISHES

Akron Varnish Co., Akron, O.

American Varnish Co., 1138 N. Branch St., Chicago, Ill.

Anglo-American Varnish Co., 53-63 Johnson St., Newark, N. J.

Armitage & Co., John L., Newark, N. J.

Atlantic Varnish Works, Richmond, Va. "Ultra-Blac."

Ault & Wilborg Co., New, Seventh & Culvert Sts., Cincinnati, O.

B. P. S.—See Patterson-Sargent Co.

Bay State—See Wadsworth, Howland & Co.

Beckwith-Chandler Co., 320 Fifth Ave., New York, N. Y.

Berry Bros., 71 Lieb St., Detroit, Mich.

Billings-Chapin Co., Cleveland, O.

Boston Varnish Co. (E. Everett), Everett, Mass.

Brooks & Co., Clarence, 249-77 Chestnut St., Newark, N. J.

Buckeye Paint & Varnish Co., 15th & Lucas Sts., Toledo, O.

Bulls-Eye—See Zinsser & Co.

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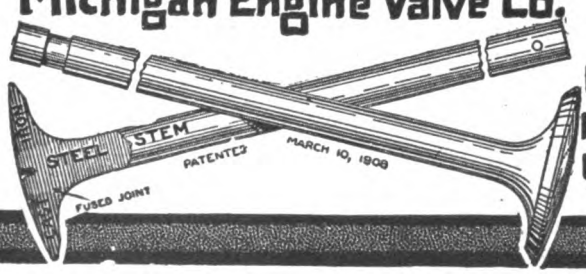

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VARNISHES (Continued)

Bunker Hill—See New England Oil, Paint & Varnish Co.

Chase, Roberts & Co., Fifth St. & West Ave., Long Island City, N. Y. "Kismet."

Chi-Var-Co—See Chicago Varnish Co.

Chicago Varnish Co., 2100 Elston Ave., Chicago, Ill. "Chi-Var-Co."

Cincinnati Varnish Co., 211 South St., Cincinnati, O.

Cleveland Varnish Co., 3111 E. 87th St., Cleveland, O. "Frelastic."

Columbus Varnish Co., Columbus, O. (See page 253.)

Da Cote—See Murphy Varnish Co.

Devoe & C. T. Raynolds Co., F. W., 101 Fulton St., New York, N. Y.

Effecto—See Pratt & Lambert.

Elmendorf Varnish Co., 845 Larrabee St., Chicago, Ill.

Empire Varnish Co., 2638-42 E. 76th St., Cleveland, O.

Flint Varnish & Color Works, Flint, Mich.

Flood & Conklin Co., 136 Chestnut St., Newark, N. J. "Radium."

Forest City Paint & Varnish Co., 3334 Lakeside Ave., Cleveland, O.

Frelastic—See Cleveland Varnish Co.

French & Co., Samuel H., York Ave., Fourth & Callowhill Sts., Philadelphia, Pa.

Gillespie & Son, Chas. H., 19 Dey St., Jersey City, N. J.

Glidden Co., Cleveland, O. (See page 741.)

Gold Cross—See Stewart-Mowry Co.

Graves Co., N. Z., 22-26 S. Third St., Philadelphia, Pa.

Gregg Varnish Co., St. Louis, Mo.

Harrison Works, 3523 Grays Ferry Rd., Philadelphia, Pa. "Vitrolac."

Hildreth Varnish Co., 90 West St., New York, N. Y.

Impervo—See Moore & Co.

International Mfg. & Sales Co., 6304 Wallace St., Chicago, Ill. "Schein."

Kismet—See Chase, Roberts & Co.

Lucas & Co., John, 322-30 Race St., Philadelphia, Pa.

McDougall Varnish Co., 24 Evans St., Buffalo, N. Y.

Masury & Son, John W., 44-50 Jay St., Brooklyn, N. Y.

Moller & Schumann Co., 3 Gerry St., Brooklyn, N. Y.

Moore & Co., Benjamin, 231-33 Front St., Brooklyn, N. Y. "Impervo."

Mound City Paint & Color Co., 11th & Mullanphy Sts., St. Louis, Mo.

Murphy Varnish Co., Chestnut & McWhorter Sts., Newark, N. J. "Da-Cote."

New England Oil, Paint & Varnish Co., Everett, Mass. "Bunker Hill."

Northwestern Chemical Co., 610 State St., Marietta, O. "Norwesco." (See page 205.)

Norwesco—See Northwestern Chemical Co.

Panvar Co., 601 Bulletin Bldg., Philadelphia, Pa. (See page 755.)

Parrott Varnish Co., 453 N. Washington Ave., Bridgeport, Conn.

Patterson-Sargent Co., E. 38th & St. Clair Sts., Cleveland, O. "B. P. S."

Payson Varnish Co., 141st St. & Walnut Ave., New York, N. Y.

Pratt & Lambert, 79 Tonawanda St., Buffalo, N. Y. "Effecto."

Queen City Varnish Co., Cincinnati, O.

Radium—See Flood & Conklin Co.

Schein—See International Mfg. & Sales Co.

Schrack & Co., C., 152 N. Fourth St., Philadelphia, Pa.

Servall—See Willey Co.

Sherwin-Williams Co., 100 Canal St., Cleveland, O.

Smith & Co., Edward, Sixth St. & West Ave., Long Island City, N. Y.

Standard Varnish Works, 90 West St., New York, N. Y.

Stewart-Mowry Co., 3214 Shields Ave., Chicago, Ill. "Gold Cross."

Stulb Varnish Co., Joseph, Haddon Ave. & White Horse Pike, Camden, N. J.

Ultra-Blac—See Atlantic Varnish Works.

Valentine & Co., 456 Fourth Ave., New York, N. Y. "Vanadium."

Vanadium—See Valentine & Co.

Vitrolac—See Harrison Works.

Wadsworth, Howland & Co., 141 Federal St., Boston, Mass. "Bay State."

Western Reserve Varnish Co., Cleveland, O. (See page 733.)

Wheeler Varnish Works, 2260 Elston Ave., Chicago, Ill.

Willey Co., C. A., 14th & Hancock Sts., Long Island City, N. Y. "Servall."

Zinsser & Co., W., 195 William St., New York, N. Y. "Bulls-Eye."

VARNISHES, Aeroplane

Air-Spar—See Harland & Son.

Berry Bros., 71 Lieb St., Detroit, Mich. "Luxeberry."

Brooklyn Varnish Mfg. Co., 35 Nostrand Ave., Brooklyn, N. Y. "Kauri."

Chemical Products Co., 30 Charles River Rd., Cambridge, Mass.

Conover Co., C. E., 101 Franklin St., New York, N. Y. "Naiad."

Harland & Son, Wm., Buffalo, N. Y. "Air-Spar."

Howe Varnish Co., 253 Norman Ave., Brooklyn, N. Y. "Wing-Spar."

Kauri—See Brooklyn Varnish Mfg. Co.

Luxeberry—See Berry Bros.

Naiad—See Conover Co.

Pratt & Lambert, 75 Tonawanda St., Buffalo, N. Y. "P & L."

P & L—See Pratt & Lambert.

Rexpar—See Sherwin-Williams Co.

Sherwin-Williams Co., 601 Canal Rd., N. W., Cleveland, O. "Rexpar."

Titanine, 2 Rector St., New York, N. Y.

Valentine & Co., 456 Fourth Ave., New York, N. Y. "Valspar."

Valspar—See Valentine & Co.

Wing-Spar—See Howe Varnish Co.

VARNISHES AND PAINTS, FOR FORDS—See Paints and Varnishes

VASES, FLOWER—See Holders, Bouquet

VEHICLE MOTION RECORDERS—See Recorders, Vehicle

VENEER ROOFING—See Panels, Wood

VENTILATING HOOD FASTENERS—See Fasteners, Ventilating Hood

VENTILATING HOOD HOLDERS—See Fasteners, Ventilating Hood

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Hendrickson Motor Truck Co., Chicago, Ill.
Gary Motor Truck Co., Gary, Ind.
Rennoc-Leslie Motor Co., Philadelphia, Pa.
Victor Motor Truck & Trailer Co., Chicago, Ill.
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Master Equipment Co., 2200 S. Main St., Los Angeles, Cal.
Petry Co., N. A., 1309 Race St., Philadelphia, Pa.
Ufasco—See Unique Findings & Supply Co.
Unique Findings & Supply Co., Providence, R. I. "Ufasco."

VENTILATORS, FORE-DOOR—See Ventilators, Limousine

VENTILATORS, FRONT COMPARTMENT, FOR FORDS—See Ventilators, Dashboard

VENTILATORS, Limousine and Fore-Door

Attwood Brass Works, Grand Rapids, Mich. (See page 531.)
Cowles & Co., C., New Haven, Conn. (See page 339.)
Douglas & Lomason Co., 642 Lincoln Ave., Detroit, Mich.
O'Brien Mfg. Co., Joseph F., 391 Broadway, New York, N. Y.
Ochsner & Sons Co., A., 1060 State St., New Haven, Conn.
Smith & Co., Jos. N., E. Grand Blvd. & Dubois St., Detroit, Mich.
Ufasco—See Unique Findings & Supply Co.
Unique Findings & Supply Co., Providence, R. I. "Ufasco."
Western Brass Mfg. Works, Marshall Blvd., 21st St. & C. B. & Q. R. R., Chicago, Ill.

VENTILATORS, Wind Shield

Morris Hardware Co., Connellsville, O. "Ventor."
Security Co., 56 Terminal Way, Pittsburgh, Pa.
Ventor—See Morris Hardware Co.

VENTILATORS, Wind Shield, for Fords

Banker Windshield Co., Ellsworth & Negley Aves., Pittsburgh, Pa.
Big B—See Bruening Windshield Co.
Bruening Windshield Co., 2067 Euclid Ave., Cleveland, O. "Big B."
Edelmann & Co., E., 341-63 E. Ohio St., Chicago, Ill.
General Auto Specialty Co., 151 Berkeley St., Boston, Mass.
Halladay Co., L. P., 501 N. Monroe St., Streator, Ill.
Michigan Auto Products Co., Detroit, Mich. "Ospeco." (See page 605.)
Motor Products Corporation, Detroit, Mich. (See page 231.)
Nelson Mfg. Co., A., 2700 Southport Ave., Chicago, Ill.
Ospeco—See Michigan Auto Products Co.
Richards-Wilcox Mfg. Co., Third St. & C. B. & Q. R. R. Tracks, Aurora, Ill.
Security Co., 56 Terminal Way, Pittsburgh, Pa.
Simplex Mfg. Co., Jackson St. & C. I. Ry., Anderson, Ind.
Zinke Co., 1323-25 Michigan Ave., Chicago, Ill. (Sole Distributors for Shurnuff Mfg. Co., St. Louis, Mo.)

VIBRATORS, MASTER—See Coils, Spark

VIBRATORS, Master, for Fords

(See also Coils, Spark)

American Coil Co., Foxboro, Mass.
Briggs & Stratton Co., Hopkins & Lewis Sts., Milwaukee, Wis.
Brown Co., 213 Bellevue Ave., Syracuse, N. Y.
Connecticut Telephone & Electric Co., Meriden, Conn. (See pages 676 and 677.)
Crowe—See Lisle Mfg. Co.
Fansteel Products Co., North Chicago, Ill. (See page 737.)
J. & B. Mfg. Co., Pittsfield, Mass.
K-W Ignition Co., 2000 Chester Ave., Cleveland, O. (See page 449.)
Kingston—See Kokomo Electric Co.
Kokomo Electric Co., 1415 Webster St., Kokomo, Ind. "Kingston."
Lisle Mfg. Co., Clarinda, Ia. "Crowe."
New Era Spring & Specialty Co., 1138 Hamilton St., N. W., Grand Rapids, Mich. (See page 355.)
New York Coil Co., 338-40 Pearl St., New York, N. Y. "TX."
R. C. W.—See Wells Mfg. Co.
TX—See New York Coil Co.
Temco Electric Motor Co., Leipsic, O.
Wells Mfg. Co., R. C., Fond du Lac, Wis. "R. C. W."

VISE STANDS—See Stands, Aircraft Propeller Vise

VISES, BENCH—See Vises, Machinists'

VISES, Machinists'

Ajax—See Bonney Vise & Tool Works.
Anchor—See Prentiss Vise Co.
Athol Machine Co., Athol, Mass. "Simpson," "Standard."
Barbour-Stockwell Co., 205 Broadway, Cambridgeport, Mass.
Bonney Vise & Tool Works, Allentown, Pa. "Hercules," "Ajax," "Champion." (See page 293.)
Braunsdorf-Mueller Co., 205 Madison St., Elizabeth, N. J.
Bull Dog—See Prentiss Vise Co.
Champion—See Bonney Vise & Tool Works.
Erie Tool Works, 640 W. 12th St., Erie, Pa.
F & R—See Fulton Machine & Vise Co.
Fisher & Norris, 37-45 Fair St., Trenton, N. J.
Fulton Machine & Vise Co., Lowville, N. Y. "Star" "Peerless," "F & R."
Goodell-Pratt Co., Greenfield, Mass. (See page 751.)
Hercules—See Bonney Vise & Tool Works.
Hollands Mfg. Co., 348-52 E. 18th St., Erie, Pa.
Howard Iron Works, Chicago & Granger Sts., Buffalo, N. Y.
Jersey—See Stanley Rule & Level Co.
Lewis—See Prentiss Vise Co.
Luther Grinding Mfg. Co., 285 S. Water St., Milwaukee, Wis.
Merrill Bros., 3 Arnold St., Maspeth, N. Y.
Monarch—See Prentiss Vise Co.

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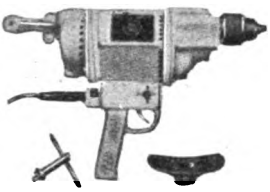

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Wyeth Hardware Co., St. Joseph, Mo.
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Motor & Machinists' Supply Co., Kansas City, Mo.
Motor Mercantile Co., Salt Lake City, Utah
Western Motor Supply House, Milwaukee, Wis.
Electric Appliance Co., Chicago, Ill.
Nicols, Dean, Gregg Co., St. Paul, Minn.
Chicago Cycle Supply Co., Chicago, Ill.
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Schlafer Hardware Co., Appleton, Wis.

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VISES, Machinists' (Continued)

Parker Co., Charles, 48 Elm St., Meriden, Conn.
Peerless—See Fulton Machine & Vise Co.
Phoenix Hardware Co., 49-53 Illinois St., Buffalo, N. Y.
Prentiss Vise Co., 110 Lafayette St., New York, N. Y. "Anchor," "Bull Dog," "Lewis," "Monarch," "Rapid Transit."
Rapid Transit—See Prentiss Vise Co.
Reed Mfg. Co., Eighth St. & E. & P. Tracks, Erie, Pa.
Rock Island Mfg. Co., Rock Island, Ill. (See page 753.)
Simpson—See Athol Machine Co.
Standard—See Athol Machine Co.
Stanley Rule & Level Co., 111 Elm St., New Britain, Conn. "Jersey."
Star—See Fulton Machine & Vise Co.
Yost Mfg. Co., G. M., Meadville, Pa.

VISES, Pipe

Armstrong Mfg. Co., 335 Knowlton St., Bridgeport, Conn.
Athol Machine Co., Athol, Mass.
Blake—See Prentiss Vise Co.
Dikeman Mfg. Co., Merwin St., Norwalk, Conn.
Erie Tool Works, 640 W. 12th St., Erie, Pa.
Fisher & Norris, 37-45 Fair St., Trenton, N. J.
Hollands Mfg. Co., 348-52 E. 18th St., Erie, Pa.
Ideal—See Orange Machine & Mfg. Co.
Magic—See Prentiss Vise Co.
Mark Mfg. Co., Chicago, Ill.
Monarch—See Prentiss Vise Co.
Orange Machine & Mfg. Co., 280 S. Jefferson St., Orange, N. J. "Ideal."
Oswego Tool Co., 119-27 W. First St., Oswego, N. Y.
Parker Co., Charles, 48 Elm St., Meriden, Conn.
Phoenix Hardware Co., 49-53 Illinois St., Buffalo, N. Y.
Prentiss Vise Co., 110 Lafayette St., New York, N. Y. "Blake," "Monarch," "Rex," "20th Century," "Shepard," "Magic."
Reed Mfg. Co., Eighth St. & E. & P. Tracks, Erie, Pa.
Rex—See Prentiss Vise Co.
Rock Island Mfg. Co., Rock Island, Ill. (See page 753.)
Saunders Sons, D., 27 Atherton St., Yonkers, N. Y.
Shepard—See Prentiss Vise Co.
20th Century—See Prentiss Vise Co.
Walworth Mfg. Co., Boston, Mass.
Whittington-Vaughn Co., Northampton National Bank Bldg., Easton, Pa.
Williams & Co., J. H., 38 Richards St., Brooklyn, N. Y. (See page 433.)
Yost Mfg. Co., G. M., Meadville, Pa.

VISES, Piston, for Fords

Storm Mfg. Co., Dept. D., Thompson, Ia. (See page 621.)

VISES, Special and Portable

Autovise—See Rock Island Mfg. Co.
Bonney Vise & Tool Works, Allentown, Pa. "Champion," "Standard." (See page 293.)
Champion—See Bonney Vise & Tool Works.
F & R—See Fulton Machine & Vise Co.
Fulton Machine & Vise Co., Lowville, N. Y. "F & R."
Parker Co., Charles, 48 Elm St., Meriden, Conn.
Rock Island Mfg. Co., Rock Island, Ill. "Autovise." (See page 753.)
Standard—See Bonney Vise & Tool Works.

VISORS and RAIN SHIELDS, Wind Shield

Bruening Windshield Co., 2062 Euclid Ave., Cleveland, O.
Frey Mfg. Co., 1326 Michigan Ave., Chicago, Ill. "U-Can-C."
Howwel Specialty Co., East Orange, N. J.
Motor Row Top Co., 1816-18 S. Fourth Ave., Rock Island, Ill. "Pearson's."
Pearson's—See Motor Row Top Co.
Road-View—See Smith & Co.
Simon & Co., S. C., 404-12 Brown St., Philadelphia, Pa.
Smith & Co., Jos. N., E. Grand Blvd. & Dubois St., Detroit, Mich. "Road-View."
U-Can-C—See Frey Mfg. Co.

VISORS and RAIN SHIELDS, Wind Shield, for Fords

(Leather or fabric strip to attach to top to close up space between top and wind shield)

Acorn Buggy Co., 500 Eggleston Ave., Cincinnati, O.
Adjust-O-Shield—See Michigan Tire & Accessories Co.
American Automobile Accessories Co., B. & O. R.R. & Blue Rock St., Cincinnati, O. "3A."
Bear Mfg. Co., E. 17th St. & First Ave., Rock Island, Ill.
Chicago Wholesale Saddlery & Mfg. Co., 125-27 N. Halsted St., Chicago, Ill.
Gordon Co., J. P., 303 N. Fourth St., Columbus, O. (See page 225.)
Michigan Tire & Accessories Co., 318 Michigan St., N. W., Grand Rapids, Mich. "Ajust-O-Shield."
Monarch Carriage Goods Co., 2838-44 Spring Grove Ave., Cincinnati, O.
Powers Mfg. Co., 1340 Sycamore St., Waterloo, Ia.
Roberts Co., C. F., 278 Brush St., Detroit, Mich.
Simon & Co., S. C., 404-12 Brown St., Philadelphia, Pa.
3A—See American Automobile Accessories Co.

VOLTMETERS — See Ammeters; also Gages, Battery

VULCANIZER THERMOMETERS — See Thermometers, Vulcanizer

VULCANIZERS, Portable

Adamson Mfg. Co., East Palestine, O. "Universal." (See page 749.)
Anderson Steam Vulcanizer Co., 108 S. Capitol Ave., Indianapolis, Ind.
Arsco Mfg. Co., 505 Union St., Schenectady, N. Y.
Brown Co., 213 Bellevue Ave., Syracuse, N. Y.
C. S.—See Canton Specialty Co.
Canton Specialty Co., Canton, Ill. "C. S." (See page 609.)
Champion, F. M., 286 Elizabeth St., Utica, N. Y.
Continental Auto Parts Co., Knightstown, Ind.
Davenport Vulcanizer & Mfg. Co., 506 Brady St., Davenport, Ia.

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Over 1,000,000 Motorists now use the Shaler 5 Minute Vulcanizer for repairing tube punctures, cuts, etc.; 4,000,000 more need it. Every motorist is a prospect for this handy tube vulcanizer—it should be in every car owner's tool box, for emergency use on the road or repairing tubes at home.

A 5 minute demonstration sells the Shaler Vulcanizer easily. Every sale gives you a good profit. The large resale of Patch and Heat Units is profitable and brings new customers into your store, who will also buy other accessories.

Complete Outfit Only $1.50

With 12 Patch and Heat Units

The outfit includes, the vulcanizer—12 Patch and Heat Units (6 Round for punctures, and 6 oblong for cuts)—everything you need except a match to light the dry fuel. Furnished with full instructions, in a neat box—compact enough to fit the motorist's tool box. Extra Patch and Heat Units 75 cents a dozen.

Order From Your Jobber NOW

To insure shipment—it is advisable to order from your jobber now. The great demand has exceeded our factory capacity, and shipments will be made according to priority in receipt of orders.

C. A. SHALER COMPANY

903 Fourth Street **Waupun, Wisconsin**

Oldest and Largest Manufacturers of Vulcanizers

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VULCANIZERS, Portable (Continued)

Eleck-Trick—See Gibney Tire & Rubber Co.
Exhaust Heater Vulcanizer Co., Altoona, Pa.
G. A. C.—See General Appliance Co.
General Appliance Co., 100 Boylston St., Boston, Mass. "G. A. C."
Gibney Tire & Rubber Co., Conshohocken, Pa. "Eleck-Trick."
Gilliland Mfg. & Auto Supply Co., D. C., 4247 Beethoven Ave., St. Louis, Mo.
Gilson Motor Starting Co., 940 N. Pennsylvania St., Indianapolis, Ind.
Gwynn-Bacon Vulcanizer Co., 3155 Magnolia Ave., St. Louis, Mo.
Horsey Products Co., 1422 Addison Rd., Cleveland, O.
Its-It—See Premier Electric Co.
Jiffy—See Vulcanizer Mfg. Co.
Junior—See Cleveland Auto Specialty Co.
Lazarus Mfg. Co., 750-800 Prospect Ave., Cleveland, O. "Lazco."
Lazco—See Lazarus Mfg. Co.
Magic Auto Devices Co., Lynbrook, N. Y.
Marvel Accessories Mfg. Co., 2011 E. 46th St., Cleveland, O. (See page 763.)
Meiser & Co., G. H., 6823 S. Chicago Ave., Chicago, Ill. "Quick Action."
Midland Supply Co., 209 E. Second St., Davenport, Ia. "Positive."
Midway Mechanical Co., 1555 Selby Ave., St Paul, Minn.
Miller, Chas. E., 1400 S. Meridian St., Anderson, Ind.
Milwaukee Auto Specialty Co., 705-15 Chestnut St., Milwaukee, Wis. "Radio."
National Cement & Rubber Co., 300-16 S. St. Clair St., Toledo, O.
National Motor Supply Co., Painesville, O. "Wizard."
Perfection—See Sterling Specialty Mfg. Co.
Positive—See Midland Supply Co.
Premier Electric Co., 4034 Ravenswood Ave., Chicago, Ill. "Its-It."
Quick Action—See Meiser & Co.
Radio—See Milwaukee Auto Specialty Co.
Safety Vulcanizer Mfg. Co., 213-15 Federal Ave., S., Mason City, Ia.
Shaler Co., C. A., 903 Fourth St., Waupun, Wis. "Vul-Kit," "Stitch-In-Time." (See pages 247, 745 and 747.)
Simplex Auto Devices Co., 311 W. 59th St., New York, N. Y. (See page 803.)
Sterling Specialty Mfg. Co., 119 Verplank St., Buffalo, N. Y. "Perfection."
Stitch-in-Time—See Shaler Co.
Super-Vulcanizer Mfg. Co., 68-70 W. Fourth South St., Salt Lake City, Utah. (See page 749.)
Superior Vulcanizer Co., 16 Fulton Ave., Rochester, N. Y.
Swain, C. E., 860 N. Virgil Ave., Los Angeles, Cal.
Tongemon Vulcanizer Co., Plymouth Bldg., Minneapolis, Minn.
Universal—See Adamson Mfg. Co.
V Air Valve & Mfg. Co., 1648 Tremont St., Denver, Colo.
Vul-Kit—See Shaler Co.
Vulcanizer Mfg. Co., 1805 N. 20th St., Philadelphia, Pa. "Jiffy."
Westinghouse Electric & Mfg. Co. (E. Liberty), Pittsburgh, Pa.
Wheeling Stove & Range Co., 86 19th St., Wheeling, W. Va.
Wizard—See National Motor Supply Co.
Worcester Mfg. Co., 13 Grafton St., Worcester, Mass.

VULCANIZERS, Portable, for Fords

Bear Mfg. Co., E. 17th St. & First Ave., Rock Island, Ill.
Exhaust Heater Vulcanizer Co., Altoona, Pa.
G-Whiz—See National Motor Supply Co.
Horsey Products Co., 1426 Addison Rd., Cleveland, O.
Humboldt Machine & Stamping Co., 31-35 Tenth St., Long Island City, N. Y.
Lazarus Mfg. Co., 750-800 Prospect Ave., Cleveland, O. "Lazco."
Lazco—See Lazarus Mfg. Co.
Marvel Accessories Mfg. Co., 2011 E. 46th St., Cleveland, O. (See page 763.)
National Motor Supply Co., Painesville, O. "G.-Whiz."
Shaler Co., C. A., 903 Fourth St., Waupun, Wis. (See pages 247, 745 and 747.)

VULCANIZERS, Shop

Acme Supply Co., Ionia, Mich.
Akron Rubber Mold & Machine Co., 917 Sweitzer Ave., Akron, O. "Tip-Top."
Akron-Williams—See Williams Foundry & Machine Co.
Allen—See Diamond Mfg. Co.
Arthur Vulcanizing Machine Co., Griswold St., Warren, O.
Auto-Tire Vulcanizing Co., 140 Powell St., Lowell, Mass. "Lowell."
Bacon Vulcanizing Mfg. Co., 1853-55 38th Ave., Oakland, Cal.
Badger—Se Tire Repair Equipment Co.
Biggs Boiler Works Co., Bank & Williams Sts., Akron, O.
Boicourt Co., 1001 W. R. R. Ave., Fort Worth Tex. "Hibbs."
Burge Machine Works, 218-30 N. Jefferson St., Chicago, Ill. "Excelsior."
Clark—See Consolidated Products Co.
Consolidated Products Co., 1838 Central Ave., Cleveland, O. "Clark."
Diamond Mfg. Co., Des Moines, Ia. "Allen."
Excelsior—See Burge Machine Works.
Giant—See H & H Mfg. Co.
H. & H. Mfg. Co., 511 N. Ninth St., Lafayette Ind. "Giant."
Handy Vulcanizer Co., 4470 Broadway, Chicago, Ill.
Hayner—See Mason Mfg. Co.
Haywood Tire & Equipment Co., 719 N. Capitol Ave., Indianapolis, Ind.
Hibbs—See Boicourt Co.
Lowell—See Auto-Tire Vulcanizing Co.
Martin & Bro., Fred., 161 Bertie St., Pomona, Cal.
Marvel Accessories Mfg. Co., 2011 E. 46th St., Cleveland, O. (See page 763.)
Mason Mfg. Co., Mason, Mich. "Hayner."
Miller, Chas. E., 1400 S. Meridian St., Anderson, Ind.
Milwaukee Auto Specialty Co., 705-15 Chestnut St., Milwaukee, Wis. "Radium."
National Motor Supply Co., Painesville, O.
Progressive Mfg. Co., 468 64th Ave., West Allis, Wis.
Radium—See Milwaukee Auto Specialty Co.
Shaler Co., C. A., 903 Fourth St., Waupun, Wis. (See pages 247, 745 and 747.)
Southwark Foundry & Machine Co., 400 Washington Ave., Philadelphia, Pa.
Superior Vulcanizer Co., 16 Fulton Ave., Rochester, N. Y.
Tip-Top—See Akron Rubber Mold & Machine Co.
Tire Repair Equipment Co., 740 Johnson St., Appleton, Wis. "Badger."

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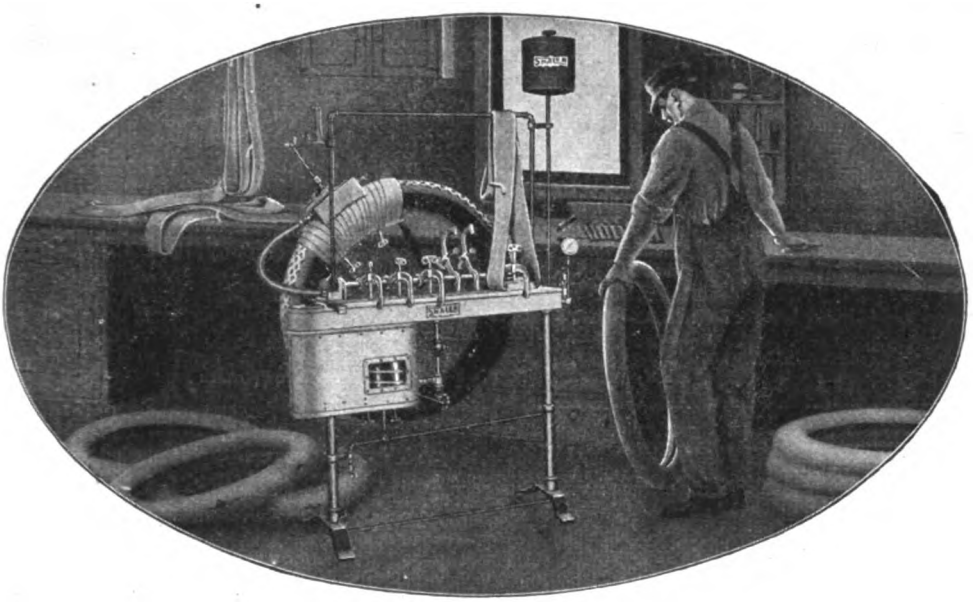

SHALER VULCANIZER

For Repair Shops and Garages

Successful results are certain with the SHALER Vulcanizer. You don't need experience—just follow instructions—to turn out perfect jobs.

By the new SHALER Wrapped-Tread Method, casings are mended quicker, better and at less cost to you than with other vulcanizers using the old method.

The SHALER Vulcanizer has thermostatic heat control, which regulates the temperature automatically. This makes an explosion impossible, prevents overheating or undercuring the tire—and leaves you free to devote your entire time to repairing.

Any style or size of casing or tube can be repaired. The SHALER Vulcanizer occupies no more space than a bicycle, and can be moved about easily.

LARGE CAPACITY—TUBES AND CASINGS

The SHALER Vulcanizer is designed for practical vulcanizing and intended for large volume of work. It handles six tubes and one casing AT ONE TIME—a total of 200 tubes and 12 casings in eight hours.

Figure out for yourself what this daily capacity of the SHALER Vulcanizer will mean. Consider the handsome profits it will earn for you—every day in the year.

The steam heated model shown above lists at $70.00 (subject to trade discount). There are other models, heated by steam or electricity, to meet every requirement of repair shop or garage.

This is the model used by the leading automobile schools and by the United States Government

Any Jobber in the United States Can Supply You
Write for Catalog

C. A. SHALER CO., 903 Fourth St., Waupun, Wis.

Oldest and Largest Manufacturers of Vulcanizers

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VULCANIZERS, Shop (Continued)

Vanderpool Co., 731 W. Mulberry St., Springfield, O.

Wheeling Stove & Range Co., 86 Tenth St., Wheeling, W. Va.

Wilkinson Mfg. Co., 701 Third St., San Bernardino, Cal.

Willey Vulcanizing Machine Co., 13 W. Jackson St., Battle Creek, Mich.

Williams Foundry & Machine Co., 100 Walnut St., Akron, O. "Akron-Williams." (See page 733.)

Zwebell Bros. Co., 482 Milwaukee St., Milwaukee, Wis.

VULCANIZING COMPOUNDS—See Compounds, Tire Repair

VULCANIZING CORES—See Molds, Tire Vulcanizing

VULCANIZING MOLDS—See Molds, Tire Vulcanizing

WARMERS, FOOT—See Heaters, Automobile

WASH APRONS—See Aprons, Wash

WASH STAND LIGHTS—See Lights, Wash Stand

WASHER CUTTERS—See Cutters, Washer or Gasket

WASHER PUNCHES—See Punches, Arch and Washer

WASHERS, AIR—See Cleaners, Air

WASHERS, Cork

Acco—See Armstrong Cork Co.

Armstrong Cork Co., 133 23d St., Pittsburgh, Pa. "Acco."

Diamond Cork Co., 59 Pearl St., New York, N. Y.

Gasket Supply Co., 1728 Ludlow St., Philadelphia, Pa. "Right." (See page 439.)

Mundet & Son, L., King, Ferris & Sullivan Sts., Brooklyn, N. Y.

Paddock Cork Co., 1209-17 De Kalb Ave., Brooklyn, N. Y. (See page 325.)

Right—See Gasket Supply Co.

Spanish-American Cork Co., 2211 Pennsylvania Ave., Baltimore, Md.

WASHERS, Felt

(For Sheet Felt—See Felt, Sheet)

Advance Felt Specialty & Cutting Co., 315 S. Jefferson St., Chicago, Ill. (See page 287.)

American Felt Co., 100 Summer St., Boston, Mass. (See page 283.)

Auburn Leather Goods Co., 3 Miller St., Auburn, N. Y.

Booth Felt Co., 440-50 19th St., Brooklyn, N. Y. (See page 749.)

Braunsdorf, Geo. W., 430 E. 53d St., New York, N. Y.

Brawley, T. R., 85-87 Adams St., Brooklyn, N. Y. (See page 753.)

Gasket Supply Co., 1728 Ludlow St., Philadelphia, Pa. "Right." (See page 439.)

House & Sons, Chas. W., Unionville, Conn.

Rhodes & Co., James H., 157 W. Austin Ave., Chicago, Ill. "Rhocom."

Rhocom—See Rhodes & Co.

Right—See Gasket Supply Co.

Standard Felt Co., West Alhambra, Cal.

Star Felt Cutting Co., 260 69th St., Brooklyn, N. Y.

Sutherland Co., F. L., 189 Beaubien St., Detroit, Mich. (See page 523.)

Western Felt Works, 4115-33 Ogden Ave., Chicago, Ill.

WASHERS, FELT, FOR FORDS—See Gaskets, Felt

WASHERS, FIBRE—See Fibre, Hard

WASHERS, Finishing

Gasket Supply Co., 1728 Ludlow St., Philadelphia, Pa. "Right." (See page 439.)

Keeler Brass Co., 261-71 Godfrey Ave., Grand Rapids, Mich.

Metal Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

Read Co., A. P., 568 W. Washington St., Chicago, Ill.

Right—See Gasket Supply Co.

Stanley Works, New Britain, Conn. (See page 347.)

WASHERS, Iron and Steel

American Iron & Steel Mfg. Co., Front & Cumberland Sts., Lebanon, Pa.

Barkelew Metal Products Co., 131 E. Second St., Dayton, O.

Bettcher Mfg. Co., 58th St. & P. C. R. R., Cleveland, O.

Bossert Corp., Utica, N. Y. (See page 363.)

Clark Bros. Bolt Co., Milldale, Conn.

Cleveland Wrought Products Co., 3590 W. 58th St., Cleveland, O.

Columbus Bolt Works Co., Columbus, O. (See page 187.)

Corbin Screw Corp., High St., New Britain, Conn.

Falls Rivet Co., Kent, O.

Gasket Supply Co., 1728 Ludlow St., Philadelphia, Pa. "Right." (See page 439.)

Hoefeld & Co., R., Buffalo, N. Y.

Hubbard Spring Mfg. Co., Pontiac, Mich. (See page 781.)

Ireland & Matthews Mfg. Co., Beard & Chatfield Sts., Detroit, Mich.

Kales Stamping Co., 443-49 Lafayette Blvd., Detroit, Mich.

McKinney Mfg. Co., Pittsburgh (N. S.), Pa.

New England Bolt & Steel Co., Bowdoin St., (Everett), Boston, Mass.

Pittsburg Screw & Bolt Co., Preble Ave., (N. S.), Pittsburgh, Pa.

Plymouth Mills, Plymouth, Mass.

Right—See Gasket Supply Co.

Quadriga Mfg. Co., 213-21 W. Grand Ave., Chicago, Ill.

Reliance Mfg. Co., Massillon, O. (See page 753.)

Republic Iron & Steel Co., Republic Bldg., Youngstown, O.

Sessions & Son, J. H., Bristol, Conn.

Smith Co., Thomas, 13 Cypress St., Worcester, Mass.

Stanley Works, New Britain, Conn. (See page 347.)

Steele & Johnson Mfg. Co., 779 S. Main St., Waterbury, Conn.

Upson Nut Co., Unionville, Conn.

Wrought Washer Mfg. Co., S. Bay & Reynolds Sts., Milwaukee, Wis.

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For Casing and Tube Repairs

There's an Adamson portable vulcanizer for every tire and tube repair that a motorist can make, priced at from $1.00 to $2.00 per outfit—and our Model "S" for garage use at $12.00. Safe, quick and sure in their work; use common gasoline.

NEW—Burns Dry Fuel

Our New Model "E" 5-Minute Vulcanizer for tube punctures uses Dry Fuel; it burns with a hot glow. No flame.

Over a Million Adamsons in Use.

Ask your Jobber.

Adamson Mfg. Co., E. Palestine, O.

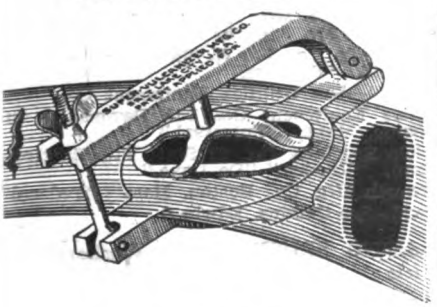
FIVE MINUTE

SUPER-VULCANIZER

TRADE MARK

Lifts the Irk from Puncture Work

All You Need is a Match



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Booth

Trade Mark

IF you buy felt washers simply by the price, you can always find some that are lower priced than ours. But if you care for quality and perfection, BOOTH'S are the lowest priced washers made.

We operate two complete and well-equipped factories, both with large stocks of felt, ready to be converted into washers, strips, gaskets or other articles, on the shortest notice.

Each factory is in charge of experienced and well-known felt experts. We have no sales offices or agencies.

Please correspond with the nearest factory. You will be answered promptly, and if you send us an order it will give us an opportunity to show you what we mean by Service.

The Booth Felt Company

Incorporated

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440 to 450 19th St.

CHICAGO
732 Sherman St., Cor. Polk

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WASHERS, Leather

Algco—See Auburn Leather Goods Co.
Auburn Leather Goods Co., 8 Miller St., Auburn, N. Y. "Algco."
Brace Leather Goods Co., 22 Wayne St., Pontiac, Mich.
Chicago Rawhide Co., 1801 Elston Ave., Chicago, Ill.
Detroit Leather Specialty Co., 275 Beecher Ave., Detroit, Mich.
Duckwall Belting & Hose Co., 201-05 N. West St., Indianapolis, Ind. (See page 469.) x
Excelsior Leather Washer Mfg. Co., 323-29 Cedar St., Rockford, Ill. (See page 751.)
Field & Co., R. B., 10 Clarence St., Worcester, Mass.
G. & K.—See Graton & Knight Mfg. Co.
Gasket Supply Co., 1728 Ludlow St., Philadelphia, Pa. "Right." (See page 439.)
Graton & Knight Mfg. Co., Worcester, Mass. "G. & K." (See page 99.)
Hoefeld & Co., R., 61-69 Carroll St., Buffalo, N. Y.
Judd & Leland Mfg. Co., Clifton Springs, N. Y. (See page 535.)
Kendrick Valve & Washer Co., 313 E. Water St., Syracuse, N. Y.
Marsh Co., Charles W., Muskegon, Mich.
Right—See Gasket Supply Co.
Simpleco—See Simplex Mfg. Co.
Simplex Mfg. Co., 38-40 Garden St., Auburn, N. Y. "Simpleco."
Sutherland Co., F. L., 139 Beaubien St., Detroit, Mich. (See page 523.)

WASHERS, MICA—See Mica

WASHERS, LOCK—See Nuts, Lock

WASHERS, PUMP—See Washers, Leather; also Washers, Tire Pump

WASHERS, RUBBER—See Rubber, Hard

WASHERS, SPRING—See Washers, Steel Spring

WASHERS, STEEL—See Washers, Iron and Steel

WASHERS, Steel Spring

Barnes Co., Wallace, Wallace & Parallel Sts., Bristol, Conn.
Hobbs Mfg. Co., 26 Salesbury St., Worcester, Mass.

WASHERS, Tire Pump Connection

Romort Mfg. Co.—See Zinke Co.
Zinke Co., 1323-25 Michigan Ave., Chicago, Ill. (Sole Distributors for Romort Mfg. Co., Oakfield, Wis. (See pages 548 and 549.)

WASHERS, Tufting

Robertson Steel & Iron Co., W. F., Elm & Second Sts., Cincinnati, O.

WASHERS, Vehicle

American Textile Mfg. Co., 1637 Haydn Ave., Cleveland, O. "No-Mar."
Arkaco—See Rennous, Kleinle & Co.
Autospra—See Hygenia Brush Co.
Binks—See Star Brass Works.
Burke—See Superior Brass Mfg. Co.
Calkins, Edwin S., 106 Charles Ave., Solvay, N. Y. "Wizard."
Cataract Auto-Vehicle Washer Co., Topeka, Kans.
Cleveland Osborn Mfg. Co., 5401 Hamilton Ave., N. E., Cleveland, O.
Cloos—See Imperial Valve Co.
De Luxe—See Vehicle Specialty Co.
Everready—See Smith Mfg. Co.
Federal—See Walworth Mfg. Co.
Fitsit—See Rennous, Kleinle & Co.
Fuller Brush Co., 74 Union Pl., Hartford, Conn.
Gaylord Sanitary Mfg. Co., 1 Gleason Pl., Rochester, N. Y.
Hahn, Arthur W., 1-7 Dominick St., New York, N. Y.
Halsted Brush Co., 71 Park Pl., New York, N. Y.
Hicks Brush Co., Howard A., 826 18th St., Denver, Colo.
Hygenia Brush Co., 15 Herman St., Worcester, Mass. "Autospra."
Imperial Valve Co., 847 Holton St., Milwaukee, Wis. "Cloos."
Irving—See Smith Mfg. Co.
Monitor—See Rhodes Mfg. Co.
Muller, Edward, 1304 John St., West New York, N. J. "Reliable."
No-Mar—See American Textile Mfg. Co.
Peerless—See Tempco Mfg. Co.
Perfection—See Ryan & Long.
Raban, W. A., Broad St., Port Chester, N. Y.
Reliable—See Muller, Edward.
Rennous, Kleinle & Co., 3221 Frederick Ave., Baltimore, Md. "Arkaco." "Fitsit."
Rhodes—See Vehicle Specialty Co.
Rhodes Mfg. Co., 948 Park St., Hartford, Conn. "Monitor."
Rich Mfg. Co., 1777 Broadway, New York, N. Y. "Rico." (See page 277.)
Rico—See Rich Mfg. Co.
Ryan & Long, 842 College Ave., Appleton, Wis. "Perfection."
Sanitax Brush Co., 2335 S. Wabash Ave., Chicago, Ill.
Scully-Jones & Co., 80 E. Jackson St., Chicago, Ill.
Smith Mfg. Co., I. J., 1007 Ave. Q, Brooklyn, N. Y. "Irving." "Everready."
Smith & Co., Jos. N., E. Grand Blvd. & Dubois St., Detroit, Mich.
Star Brass Works, 319 N. Albany Ave., Chicago, Ill. "Binks."
Superior Brass Mfg. Co., 106 S. Eighth St., St. Louis, Mo. "Burke."
Tempco Mfg. Co., 740 W. Van Buren St., Chicago, Ill. "Peerless."
Universal—See Utilities Equipment Co.
Utilities Equipment Co., 155 Devonshire St., Boston, Mass. "Universal."
Vehicle Specialty Co., 26 State St., Hartford, Conn. "Rhodes," "De Luxe."
Walworth Mfg. Co., Boston, Mass. "Federal."
Wizard—See Calkins, Edwin S.

WASHING BRUSHES—See Washers, Vehicle

WASTE CANS—See Cans, Waste

WASTE, Cotton

(For wiping rags—See Wipers)

American Manufacturers Supply Co., 297-99 Orleans St., Detroit, Mich.
Arbella Waste Co., 1210 Dorchester Ave., Boston, Mass.
Bishop Mfg. Co., Robert (S. Boston), Boston, Mass.
Blakeley & Son, John, 1089 Germantown Ave., Philadelphia, Pa.

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No. 288

Motor Sets
Valve Grinders
Bearing Scrapers
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Chisels and Punches
Socket Wrenches
Adjustable Wrenches
Rim Wrenches
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Toolsmiths

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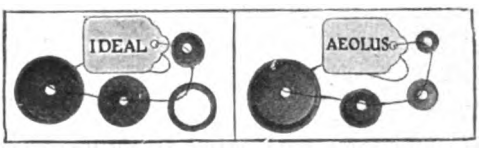
Leather Washers

NOTE TO TRADE

We are specialists in this line and are prepared to fill your order for any quantity. Estimates furnished on any kind of Fiber—paper—felt or leather washers—also on leather specialty work of all kinds.

Below we publish a partial list of complete tire pump sets. If you do not find the pump listed you want, write us for complete list.



All other sizes furnished upon your inquiry

NO.	NAME OF PUMP	TO DEALERS
1	Stapley	$0.20
2	Brown Impulse	.40
3	Imperial Wixon	.20
4	Aelous	.20
5	Nos. 99 and 50	.75
6	Kellogg and Hill	.20
7	Rex	.20
8	Skinner	.20
9	Noera Senior	.20
10	Noera Junior	.20
11	Noera Ideal	.20
12	No. 14 Pioneer	.20

¾ in. cups per doz. $0.10 — 1¾ in. cups per doz. $0.80
1 in. cups per doz. .20 — 2½ in. cups per doz. 2.00
1½ in. cups per doz. .30 — 3 in. cups per doz. 2.50
X-L-Garage Sets (100 assorted cups in set), per set $5.00

Also Manufacturers of Leather, Fibre and Felt Washers and Gaskets

EXCELSIOR LEATHER WASHER MFG. CO.
Rockford Illinois

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WASTE, Cotton (Continued)

Chicago Sanitary Rag Co., 2137-43 S. Loomis St., Chicago, Ill.
Don't-Ma—See Hoffman-Corr Mfg. Co.
Egan Waste Co., 19 Burling Slip, New York, N. Y.
Estes Mills, Fall River, Mass.
Fidelity—See Hagy Waste Works.
Fulton Bag & Cotton Mills, Atlanta, Ga.
Gross & Co., E., 95 Commerce St., Hartford, Conn.
Hagy & Son, Clayton L., 16th & Carpenter Sts., Philadelphia, Pa.
Hagy Waste Works, J. Milton, 836-42 Swanson St., Philadelphia, Pa. "Fidelity."
Hoffman-Corr Mfg. Co., 594 Broadway, New York, N. Y. "Don't-Ma."
Interwoven Mills, Martinsburg, W. Va.
Lillie Co., Dexter P., Indian Orchard, Mass.
Massasoit Mfg. Co., Fall River, Mass.
Mill Remnants Co., 80 West St., New York, N. Y.
Riverside Mills, Kollock & Tatnall Sts., Augusta, Ga.
Rowaco—See Royal Textile Co.
Royal Mfg. Co., 80 E. Grand St., Rahway, N. J.
Royal Textile Co., 200 Congress St., Boston, Mass. "Rowaco."
Snow Drift—See Sweetland Waste Co.
South Atlantic Waste Co., Charlotte, N. C.
Springfield Waste Co., Mill St., Springfield, Mass.
Standard Waste Co., Cleveland, O.
Standard Waste Mfg. Co., 2306-10 N. American St., Philadelphia, Pa.
Sweetland Waste Co. (S. Boston), Boston, Mass. "Snow Drift."
Travers Twine & Cordage Co., 81 Warren St., New York, N. Y.
Union Wadding Co., 66 Dexter St., Pawtucket, R. I.

WATCH HOLDERS—See Holders, Watch

WATCHES, Aviators' Wrist

Hamilton Watch Co., Lancaster, Pa.
Ingersoll & Bro., Robt. H., New York, N. Y.
Waltham Watch Co., Waltham, Mass.

WATCHES, Limousine

(See also Cases, Toilet and Card)

Majestic—See Wittnauer Co.
Waltham Watch Co., Waltham, Mass.
Wittnauer Co., A., 30 W. 36th St., New York, N. Y. "Majestic."

WATCHMAN'S CLOCKS—See Clocks, Time Recording and Watchman's

WATER ALARMS—See Columns, Water

WATER CARRYING BAGS—See Bags, Water Carrying

WATER CIRCULATING PUMPS, AIRCRAFT—See Pumps, Aircraft Water Circulating

WATER CIRCULATING PUMPS, MOTOR BOAT—See Pumps, Motor Boat Water Circulating

WATER CIRCULATING PUMPS, TRACTOR—See Pumps, Tractor Water Circulating

WATER CIRCULATING REGULATORS—See Regulators, Water Circulating

WATER CIRCULATION GAGES—See Gages, Water Circulation

WATER COLUMN MIRRORS—See Mirrors, Water Gage

WATER COLUMNS—See Columns, Water

WATER CONNECTIONS—See Connections, Brass Water

WATER COOLERS—See Radiators

WATER, Distilled

(For use in Storage Batteries)

Hygeia Distilled Water Co., New York, N. Y. (See page 541.)

WATER LEVEL REGULATORS—See Regulators, Water Level

WATER LEVEL INDICATING METERS—See Meters, Radiator Water Level Indicating

WATER LINE GAGES—See Gages, Boiler Water

WATER PUMPS—See Pumps, Water

WATER STILLS—See Stills, Water

WATERPROOF CEMENT, AEROPLANE—See Cement, Aeroplane Waterproof

WAYS, Balancing

(For Balancing Machine—See Machine, Balancing)

Defiance Machine Works, 434 Perry St., Defiance, O.
Rockford Tool Co., Harrison Ave. & 11th St., Rockford, Ill.

WEARING APPAREL—See Caps; also Clothing; also Gloves; also Leggings; also Mufflers

WEATHER STRIPS—See Strips, Windshield Weather

WEB STRAPS—See Straps, Web

WEBBING, COACH—See Lace, Coach

WEBBING, Jute

American Mills Co. of New York, 395 Broadway, New York, N. Y.
Buffalo Weaving & Belting Co., 234 Chandler St., Buffalo, N. Y.
Hope Webbing Co., Pawtucket, R. I.
Landers Bros. Co., Blucher & Buckingham Sts., Toledo, O.
Ludlow Mfg. Associates, 111 Devonshire St., Boston, Mass. (See page 739.)
Modern Belt & Web Co., Emerson Tower Bldg., Baltimore, Md.
Susquehanna Webbing Co., Bloomsburg, Pa.

WEDGE PLATES—See Plates, Demountable Rim Wedge

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Wicks
Gaskets

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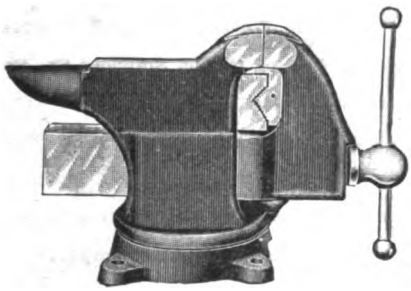

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Rock Island, Ill.

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"Type D"

"Type C"

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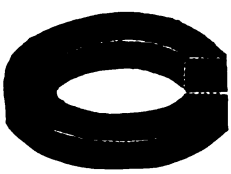
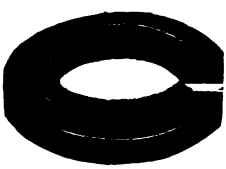
THE SAILER & MELVIN MFG. CO.

MASSILLON OHIO


Type B

Type R


Type C

MANUFACTURERS OF A COMPLETE LINE OF LOCK WASHERS

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WELDERS' GOGGLES—See Goggles, Mechanics' and Welders'

WELDING, Autogenous

Admiral Welding Machine Co., 1331 Walnut St., Kansas City, Mo.
Advance Welding Machine Co., 111 N. Desplaines St., Chicago, Ill.
American Brazing & Welding Co., 22d & Olive Sts., St. Louis, Mo.
American Welding Co., 2724 Michigan Ave., Chicago, Ill.
Atlas Welding Works, 2424 Elizabeth Ave., Rahway, N. J.
Atlas Welding & Supply Co., 2930 Penn Ave., Pittsburgh, Pa.
Bird-Wilcox Co., Atlanta, Ga.
Birmingham Welding & Machinery Co., 118 S 22d St., Birmingham, Ala.
Bizier Welding & Cutting Co., 196 11th Ave., New York, N. Y.
Bossert Corp., Utica, N. Y. (See page 363.)
Bournonville Welding Co., Eug., 241-45 W. 64th St., New York, N. Y.
Brazing & Welding Co., 1615 Wabash Ave., Chicago, Ill.
Brooklyn Welding Co., 58 York St., Brooklyn, N. Y.
Busch-Hartman Co., 716 Golden Gate Ave., San Francisco, Cal.
Cambridge Welding Works, 51 Ames St., Cambridge, Mass.
Capitol Welding Co., 45-47 Sabin St., Providence, R. I.
Cave Welding Co., 32 Liberty St., Springfield, Mass
Columbus Welding Shop, 294-96 N. Third St., Columbus, O.
Crosby Co., Buffalo, N. Y. (See page 669.)
Davis & Schegg Co., 2124 Broadway, New York, N. Y.
Dayton Welding Co., 13 S. St. Clair St., Dayton, O.
Delcampe Welding Co., 1517 Wood Ave., Bridgeport, Conn.
Des Moines Welding Co., 117-19 Grand Ave., Des Moines, Ia.
Detroit Welding Specialty Co., 96 Beaubien St., Detroit, Mich.
Dyer Co., G. H., Cambridge, Mass. (See page 505.)
General Welding Co., 355-57 14th St., Hoboken, N. J.
Gibbs Welding Co., 12th & Locust Sts., Des Moines, Ia.
Great Lakes Welding Co., 937-45 West St., Cleveland, O.
Harlem Machine Co., 2399 Eighth Ave., New York, N. Y.
Hauck Mfg. Co., 140 Livingston St., Brooklyn, N. Y.
Havens Bros. Mfg. & Supply Co., 1622 Wazee St., Denver, Colo.
Hercules Welding & Machine Co., 223-25 N. 16th St., Philadelphia, Pa.
Hobble Welding Plant, Hampton, Ia.
Hub Machine, Welding & Contracting Co., 22d & Race Sts., Philadelphia, Pa.
Jacobs Co., F. L., 449-53 Gusin St., Detroit, Mich. (See page 447.)
Johnson Welding & Auto Repair Co., 1302 S. Wabash Ave., Chicago, Ill.
K. G. Welding & Cutting Co., 556 W. 34th St., New York, N. Y.
Laclede Iron Works, 1315 Chestnut St., St. Louis, Mo.
Lawrence & Co., L., 292 Halsey St., Newark, N. J.
McCrea & Jones, 30 Catherine St., Utica, N. Y.
Manufacturers Welding Co., 740 Jamaica Ave., Brooklyn, N. Y.
Messer & Co., 121 N. Seventh St., Philadelphia, Pa.
Metal Welding & Supply Co., 809-11 Broadway, Denver, Colo.
Metals Welding Plant, 4400 Perkins Ave., Cleveland, O. (See page 400.)
Milwaukee Cylinder Grinding Co., Humboldt & Concordia Aves., Milwaukee, Wis
National Welding Co., 326-28 Dixwell Ave., New Haven, Conn.
National Welding Co., Morris Ave. & Dickerson St., Newark, N. J.
National Welding & Mfg. Co., 1413-30 Niagara St., Buffalo, N. Y.
Oakes Co., Indianapolis, Ind. (See page 279.)
Ohio Welding & Mfg. Co., 314 W. Sixth St., Cincinnati, O.
Oregon Welding & Mfg. Co., 305 Glisan St., Portland, Ore.
Oxy-Acetylene Welding Co., 1921 Grand Ave., Kansas City, Mo.
Oxy-Acetylene Welding & Machine Co., 1818 Webster Ave., New York, N. Y.
Oxy-Carbi Co., New Haven, Conn.
Pacific Coast Welding Co., 610 E. Pike St., Seattle, Wash.
Peerless Welding Co., 25 Stanhope St., Boston, Mass.
Peerless Welding Co., 505 W. 45th St., New York, N. Y.
Pioneer Welding Co., 610 E. Main St., Kalamazoo, Mich.
Pittsburgh Reinforced Brazing & Machine Co., 2525 Liberty Ave., Pittsburgh, Pa.
Pondelick Bros., 215 S. Leavitt St., Chicago, Ill.
Portland Brazing & Machine Works, 266 Glisan St., Portland, Ore.
Powell-Elliott Auto Repair Co., 148 Rogers Ave., Brooklyn, N. Y.
Pray Bros., 20 N. Eighth St., Fort Dodge, Ia.
S. & M. Welding Co., 1831-33 E. 55th St., Cleveland, O.
Sanford Mfg. Co., F. C., 2060 Fairfield Ave., Bridgeport, Conn.
Schaap Automobile Co., 344 Cumberland St., Brooklyn, N. Y. (See page 655.)
Schemmel Welding Machine Works, Wapakoneta, O.
Scored Cylinder Works, 433 Golden Gate Ave., San Francisco, Cal.
Smith & Co., W. R., 304-06 W. 52d St., New York, N. Y.
Sorenson, C., 18 E. 16th St., Chicago, Ill.
Sterling Engine Co., 331 S. Clinton St., Chicago, Ill.
Superior Welding & Machine Co., 52 Canal St., Stamford, Conn.
Trageser Steam Copper Works, John, 447-57 W. 26th St., New York, N. Y.
Trindl Machine Works, 57-61 E. 24th St., Chicago, Ill. (See page 643.)
Twin City Welding Co., 313 Seventh Ave., S., Minneapolis, Minn.
Vilter Mfg. Co., 879 Clinton St., Milwaukee, Wis.
Vulcan Brazing & Machine Co., 1630-32 Vine St., Philadelphia, Pa.
Waterbury Welding Co., 1147 South Main St., Waterbury, Conn. (See page 243.)
Waterhouse Welding Co., 15 Pelham St., Boston, Mass.
Weldrite Co., 102 Hunter Ave., Long Island City, N. Y.
Western Drop Forge Co., Marion, Ind. (See page 783.)
Wilkes-Barre Welding Co., 6 W. Ross St., Wilkes-Barre, Pa.
Worcester Pressed Steel Co., Worcester, Mass.

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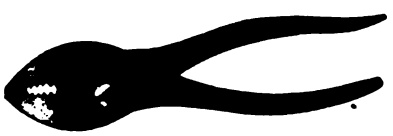

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WELDING COMPOUNDS—See Compounds, Welding

WELDING, Electric

American Welding & Mfg. Co., Griswold St., Warren, O.

Beckley Perforating Co., C. R. R. Ave., Garwood, N. J.

Billings & Spencer Co., Laurel & Park Sts., Hartford, Conn.

Cincinnati Ball Crank Co., (Oakley), Cincinnati, O. (See page 353.)

Detroit Electric Welder Co., Lansing, Mich.

Jacobs Co., F. L., 449-53 Guoin St., Detroit, Mich. (See page 447.)

Lewis Steel Products Co., Toledo, O. (See page 735.)

McDowell Mfg. Co., 541 Wood St., Pittsburgh, Pa.

Michigan Electric Welding Plant, 514 Hart Ave., Detroit, Mich. (See page 400.)

Oakes Co., Indianapolis, Ind. (See page 279.)

Pioneer—See Thomson Electric Welding Co.

Standard Parts Co., Cleveland, O. (See pages 408 and 409.)

Thomson Electric Welding Co., 161 Pleasant St., Lynn, Mass. "Pioneer."

Williams & Co., J. H., 38 Richards St., Brooklyn, N. Y. (See page 433.)

Worcester Pressed Steel Co. (Barbers Crossing), Worcester, Mass.

WELDING FLUX—See Compounds, Welding

WELDING MACHINES—See Machines, Electric Welding; also Machines, Autogenous Welding

WELDING RODS—See Rods, Welding

WELDING TORCHES—See Torches, Acetylene Brazing and Welding

WELTS, UPHOLSTERY—See Bindings, Upholstery

WET TOOL GRINDERS—See Grinders, Wet Tool

WHEEL ALIGNING GAGES—See Gages, Wheel Aligning

WHEEL ATTACHMENTS FOR FORDS—See Attachments, Tilting Wheel

WHEEL BEARINGS—See Bearings, Front Wheel

WHEEL BRAKES—See Brakes, Front Wheel

WHEEL BRUSHES—See Washers, Vehicle

WHEEL CARRIERS FOR FORDS—See Holders or Carriers, Spare Wheel

WHEEL CLOCKS—See Clocks, Steering Wheel

WHEEL DISCS FOR FORDS—See Discs, Wheel

WHEEL DRESSERS—See Dressers, Emery Wheel

WHEEL GAGES, ALIGNING—See Gages, Wheel Aligning

WHEEL HOLDERS—See Holders or Carriers, Spare Wheel

WHEEL PULLERS—See Pullers, Gear and Wheel

WHEEL RIM PLATES—See Plates, Tractor, Quick Detachable

WHEEL RIMS—See Rims, Wheel

WHEEL TIGHTENING COMPOUNDS—See Compounds—Wood Wheel Tightening

WHEEL TRUCKS—See Castors and Wheel Trucks

WHEELS, Aeroplane Pressed Steel

Detroit Pressed Steel Co., Detroit, Mich. "Disteel." (See page 365.)

Disteel—See Detroit Pressed Steel Co.

WHEELS, Aeroplane Spring

Ackerman Wheel Co., Rockefeller Bldg., Cleveland, O.

WHEELS, Aeroplane Wire

Ackerman Wheel Co., Rockefeller Bldg., Cleveland, O.

Dayton Wire Wheel Co., 825 Miami Chapel Rd., Dayton, O.

J. N.—See Wire Wheel Corp. of America.

Mott Wheel Works, Jackson, Mich.

National Wire Wheel Works, Dept. A. Geneva, N. Y. "Pasco." (See page 757.)

Palmer—See Wire Wheel Corp. of America.

Pasco—See National Wire Wheel Works.

Spranger Wire Wheel Co., Claxton Ave., Detroit, Mich.

Stewart Wire Wheel Corp., Frankford, Ind.

Wire Wheel Corp. of America, 835 11th Ave., New York, N. Y. "Palmer," "J. N." (See page 761.)

WHEELS, Cast Steel

Clark Equipment Co., Buchanan, Mich.

Dayton Steel Foundry Co., Chapel Rd. & C., H. & D. R. R., Dayton, O.

Dayton Steel Wheel Co., S. Broadway, Dayton, O.

Michigan Steel Casting Co., Detroit, Mich. (See page 241.)

Otis Elevator Co., 11th Ave. & 26th St., New York, N. Y.

Smith Wheel, Inc., Syracuse, N. Y. (See page 759.)

Standard Steel Castings Co., 3311 W. 73d St., Cleveland, O.

West Steel Casting Co., 805-41 E. 70th St., Cleveland, O.

WHEELS, DEMOUNTABLE—See Wheels, Wire

WHEELS, Demountable, for Fords

(See also Wheels, Wire; for Demountable Hubs—See Hubs, Demountable)

Dayton Wire Wheel Co., 825 Miami Chapel Rd., Dayton, O.

Eames & Co., A. M., Framingham, Mass.

Hill-Smith Metal Goods Co., Dept. H. Boston, Mass. (See page 221.)

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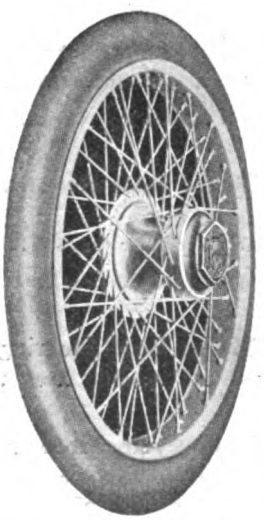

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WHEELS, Demountable, for Fords (Continued)

Holland Demountable Wheel Co., Holland, Mich.

Minute—See Hill-Smith Metal Goods Co.

Minute Auto Wheel Co., Georgetown, Ky.

Standard Auto Accessory Co., 100 Mill St., Leipsic, O.

Stone-Thompson Mfg. Co., 1502 Michigan Ave., Chicago, Ill. (See page 577.)

Telford—See White Machine Works.

White Machine Works, A. E., Eau Claire, Wis. "Telford."

WHEELS, EMERGENCY—See Wheels, Special

WHEELS, Fifth

(For applying to the rear deck of the car so that trailer can be mounted)

Borst Coupler Control Mfg. Co., 1186 Main St., Buffalo, N. Y.

Martin Rocking Fifth Wheel Co., Springfield, Mass. (See page 759.)

WHEELS, Motor Boat Propeller

American Manganese Bronze Co. (Holmesburg), Philadelphia, Pa.

B & B—See Bryant & Berry Propeller Co.

Barber Bros., 500 E. Water St., Syracuse, N. Y.

Bryant & Berry Propeller Co., 45 Atkinson Ave., Detroit, Mich. "B & B".

Camden Anchor-Rockland Machine Co., Camden, Me. "Knox."

Columbian Bronze Corp., 50 Church St., New York, N. Y.

Eisenbrandt, F. B., Light St., Baltimore, Md.

Herthan—See McFarland Foundry & Machine Co.

Hyde Windlass Co., Bath, Me.

Knox—See Camden Anchor-Rockland Machine Co.

McFarland Foundry & Machine Co., Trenton, N. J. "Herthan."

Michigan Wheel Co., 1113 Monroe Ave., Grand Rapids, Mich.

Stickler Weedless Wheel Co., Cook St., Portage, Wis.

WHEELS, Motor Boat Reversing Propeller

F. I. A. Reversible Propeller Co., 500 E. Water St., Syracuse, N. Y.

Michigan Wheel Co., 1113 Monroe Ave., Grand Rapids, Mich.

WHEELS, Motor Boat Steering

Edson Mfg. Co., 257 Atlantic Ave., Boston, Mass.

WHEELS, Motorcycle Motor

Merkel Motor Wheel Co., Rochester, N. Y.

Smith Corp., A. O., Milwaukee, Wis. (See page 343.)

WHEELS, PNEUMATIC—See Wheels, Special

WHEELS, Pressed and Wrought Steel

All-Steel Wheel Co., Widener Bldg., Philadelphia, Pa.

Cleveland Welding & Mfg. Co., Cleveland, O. "Parker-Hydraulic."

Detroit Pressed Steel Co., Detroit, Mich. "Disteel." (See page 365.)

Disteel—See Detroit Pressed Steel Co.

French & Hecht, Third & Farnum Sts., Davenport, Ia.

Hart-Parr Co., Lawler St., Charles City, Ia.

Hayes Wheel Co., Jackson, Mich.

Parker-Hydraulic—See Cleveland Welding & Mfg. Co.

WHEELS, REMOVABLE—See Wheels, Wire

WHEELS, Repairing of

Chicago Wheel & Rim Co., 2010-12 Wabash Ave., Chicago, Ill. (See page 763.)

WHEELS, Special Pneumatic, Spring and Emergency

American Motor Wheel Co., Ben Hur Bldg., Crawfordsville, Ind. "Coats."

Autocraft Co., 126 State St., Boston, Mass.

Automobile Spring Wheel Co., 413 W. Broadway, New York, N. Y. "Sipe."

Coats—See American Motor Wheel Co.

Durgin Auto Wheel Co., Lawrence National Bank Bldg., Lawrence, Kans. "Modlin."

Gray Bros., 321 S. La Salle St., Chicago, Ill.

Halsey & Lothrop, 126 State St., Boston, Mass.

Houston Pneumatic Puncture-Proof Wheel Co., 721 Frankfort Ave., Cleveland, O.

Hub Shock Absorber Wheel Co., Lancaster, Pa.

Jenkins Emergency Wheel Co., Mutual Bldg., Richmond, Va.

Kunz Wheel Co., 2601 Vleit St., Milwaukee, Wis.

Martin—See Morand-Martin Cushion Wheel Co.

Mathieson Spring Cushion Wheel Co., 223 W. Grand Ave., Chicago, Ill.

Morand-Martin Cushion Wheel Co., 800 S. May St., Chicago, Ill. "Martin."

Modlin—See Durgin Auto Wheel Co.

Muncie Wheel Co., Ohio Ave. & Dudley St., Muncie, Ind.

National Auto Wheels Corp., 409 Jackson St., Wausau, Wis.

Peck Wheel Co., 2121 Michigan Ave., Chicago, Ill.

Pronovost Torsion Spring Wheel Co., 287 Woodward Ave., Detroit, Mich.

Rech-Marbaker Co., Eighth St. & Girard Ave., Philadelphia, Pa. "Sendelbach."

Robertson Cradlelock Wheel Co., Monadnock Bldg., Chicago, Ill.

Schick Wheel & Tire Co., 89 Indiana Ave., Wheeling, W. Va.

Sendelbach—See Rech-Marbaker Co.

Sewell Cushion Wheel Co., 1296 Gratiot Ave., Detroit, Mich.

Sipe—See Automobile Spring Wheel Co.

T. S. Wheel & Mfg. Co., 245 Oregon St., Milwaukee, Wis.

Twin Six Corp., 612 Washington St., Gary, Ind.

Urie, W. T., Independence, Mo.

Watson Wheel & Rim Corp., Hippodrome Bldg., Cleveland, O.

Wilson Tire & Rubber Co., Harvard Pk., Springfield, Ill.

WHEELS, STEEL—See Wheels, Pressed Steel

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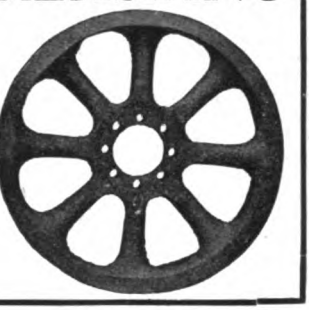
YOUR TRUCK will **run easier, last longer** and give **far greater mileage** from Tires and Gasoline, when equipped with SMITH WHEELS.

Guaranteed FOR LIFE OF TRUCK on which originally placed.

SMITH WHEEL, Inc., Syracuse, N. Y.



BIMEL SPOKE & AUTO WHEEL CO
Bimel
PORTLAND, IND.

"Indiana Second Growth Wheels"

are made for

the smallest passenger car up to the largest truck.

BIMEL SPOKE & AUTO WHEEL COMPANY

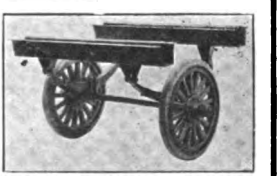
PORTLAND, IND.

Look Over These Cuts and Write Us For Full Information

One Ton Semi-trailer for Fords

Shock-Absorbing Type Fifth Wheel One to Ten Tons Capacity

Martin Floating-Bearing Trailer Axle One to Ten Tons Capacity



Martin Rear-End Assembly Ready to Attach to Trailer Bodies One to Ten Tons Capacity

Martin Rocking Fifth Wheel Company
Springfield, Mass.

Automobile Wheels

For Truck and Pleasure Car

Have You Seen Our New Truck Wheel Construction?
Better write for details.

WAYNE WHEEL COMPANY
Newark, New York State

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WHEELS, Steering

(Including Tilting Steering Wheels; for Rims only—See Rims, Rubber; also Rims, Wood Steering Wheel; For Heated Wheels—See Wheels, Heated Steering)

American Wood Rim Co., Onaway, Mich.
Becco—See Michigan Motor Specialties Co.
F. M. F.—See Sav-a-Life Fender Co.
Fold-O-Lock Steering Wheel Co., 114-16 S. Lawrence Ave., Wichita, Kans.
Gemeo Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. (See page 135.)
Kundtz Co., Theodor, Cleveland, O. (See page 105.)
Michigan Motor Specialties Co., 26-40 Dubois St., Detroit, Mich. "Becco."
Neville Steering Wheel & Mfg. Co., Detroit, Mich. (See page 761.)
Pouvailsmith Corp., Poughkeepsie, N. Y.
Sav-a-Life Fender Co., Guardian Bldg., Cleveland, O. "F. M. F."
Standard Steering Wheel Co., Cleveland, O.
Tucker Wood Work Co., Sidney, O.
Vincent Clear Room Steering Wheel Co., 756 Woodward Ave., Detroit, Mich.

WHEELS, Steering, for Fords

(Including large and tilting wheels; for Heated Wheels—See Wheels, Heated.)

American Metal Parts Co.—See Fulton Co.
Au-To Compressor Co., Wilmington, O. "Oro."
Badger Mfg. Corp., Milwaukee, Wis. (See page 139.)
Becco—See Michigan Motor Specialties Co.
Fold-O-Lock Steering Wheel Co., 114-16 S. Lawrence Ave., Wichita, Kans.
Fulton Co., 1910 St. Paul Ave., Milwaukee, Wis. (Sole Distributors for American Metal Parts Co., Milwaukee, Wis.) (See page 139.)
Gemeo Mfg. Co., 666 S. Pierce St., Milwaukee, Wis. (See page 135.)
Halladay Co., L. P., 501 N. Monroe St., Streator, Ill.
Hasco—See Howard Auto Specialties Co.
Howard Auto Specialties Co., Swampscott, Mass. "Hasco."
Michigan Motor Specialties Co., 26-40 Dubois St., Detroit, Mich. "Becco."
Neville Steering Wheel & Mfg. Co., Detroit, Mich. (See page 761.)
Oro—See Au-To Compressor Co.
Vincent Clear Room Steering Wheel Co., 756 Woodward Ave., Detroit, Mich.
Warner Gear Co., Muncie, Ind. (See page 414.)

WHEELS, Heated Steering

(For Regular Steering Wheels—See Wheels, Steering)

Ieco Steerwarms—See Interstate Electric Co.
Interstate Electric Co., Baronne & Perdido Sts., New Orleans, La. "Ieco Steerwarms."
Pouvailsmith Corp., Poughkeepsie, N. Y. "Povasco."
Povasco—See Pouvailsmith Corp.

WHEELS, Heated Steering, for Fords

(For car heaters—See Heaters, Automobile)

Pouvailsmith Corp., Poughkeepsie, N. Y. "Povasco."
Povasco—See Pouvailsmith Corp.

WHEELS, TILTING—See Wheels, Steering

WHEELS, Tractor

American Welding & Mfg. Co., Griswold St., Warren, O.
Electric Wheel Co., Walton Heights, Quincy, Ill.

WHEELS, Wire

(Including both Standard and Demountable Wheels)

Budd Wheel Corp., 22nd St. & Lehigh Ave., Philadelphia, Pa.
Dayton Wire Wheel Co., 825 Miami Chapel Rd., Dayton, O.
Frayer—See Phelps Mfg. Co.
Grant Wire Wheel Mfg. Co., 20 E. Jackson Blvd., Chicago, Ill.
Hayes Wheel Co., Jackson, Mich.
Mott Wheel Works, Jackson, Mich.
National Wire Wheel Works, Dept. A, Geneva, N. Y. "Pasco." (See page 757.)
Pasco—See National Wire Wheel Works.
Phelps Mfg. Co., Columbus, O. "Frayer." (See page 761.)
Rudge-Whitworth—See Standard Roller Bearing Co.
Spranger Wire Wheel Co., Clayton Ave., Detroit, Mich.
Standard Parts Co., Cleveland, O. "Stanweld." (See pages 408 and 409.)
Stanweld—See Standard Parts Co.
Standard Roller Bearing Co., Philadelphia, Pa. "Rudge-Whitworth." (See page 113.)
Stewart Wire Wheel Corp., Frankford, Ind.
Wire Wheel Corp. of America, 835 11th Ave., New York, N. Y. (See page 761.)

WHEELS, Wire, for Fords

(For Demountable Wheels—See Wheels, Demountable)

De-Luxe—See Kol-Ben Wheel Co.
Grant Wire Wheel Mfg. Co., 20 E. Jackson Blvd., Chicago, Ill.
Great Western Mfg. Co., Laporte, Ind. "Lindsay."
House—See Wire Wheel Corp. of America.
Kol-Ben Wheel Co., Grand River & Loraine St., Detroit, Mich. "De-Luxe."
Lindsay—See Great Western Mfg. Co.
Mott Wheel Works, Jackson, Mich.
National Wire Wheel Works, Dept. A, Geneva, N. Y. "Pasco." (See page 757.)
Pasco—See National Wire Wheel Works.
Spranger Wire Wheel Co., Clayton Ave., Detroit, Mich.
Standard Parts Co., Cleveland, O. (See pages 408 and 409.)
Standard Welding Co., Cleveland, O.
Wire Wheel Corp. of America, 835 11th Ave., New York, N. Y. "House." (See page 761.)

WHEELS, Wood

Acorn—See Crane & MacMahon.
Archibald Wheel Co., 150 West St., Lawrence, Mass.
Auburn Wheel & Mfg. Co., Auburn, R. I.
Auto Wheel Co., E. Franklin St., Lansing, Mich.
Baltimore Hub Wheel & Mfg. Co., Gay St. & Fallsway, Baltimore, Md.
Bimel Spoke & Auto Wheel Co., Portland, Ind. (See page 759.)
Central City Wheel Works, 108 Wilkinson St., Syracuse, N. Y.

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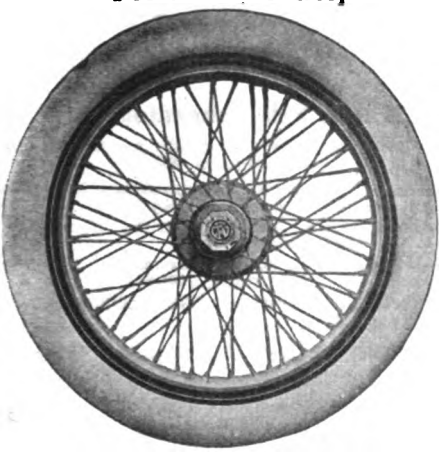
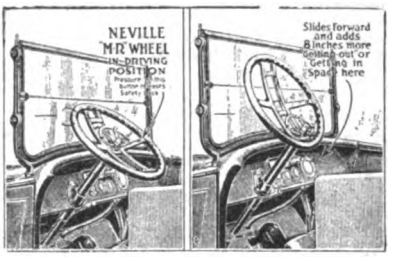
The Best Wire Wheels
For Automobiles;



FRAYER
DEMOUNTABLE
WIRE WHEELS
Catalogue upon Request

The Phelps Manufacturing Co.
COLUMBUS, OHIO.



NEVILLE
"MORE-ROOM"
STEERING WHEEL

THERE is no substitute for *more room*. This wheel provides the *one* way to get it. Slide it forward and you gain eight inches for entrance or exit.

Beautifully finished with aluminum spider. Proven mechanically correct by five years' satisfactory service. Thousands in use. Made to fit all models. Sales growing steadily. Standard equipment on many fine closed models.

There is a splendid opportunity for dealers. If you are not already pushing this wheel, write us.

Neville Steering Wheel & Mfg. Co.
Detroit, U. S. A.

HOUK QUICK CHANGE HOUSE for Fords

The large demand for wire wheels is constantly growing larger. We can make immediate deliveries of Houk wire wheels for 150 makes of cars. We will gladly quote prices on these wheels for any make or model of car.

Established dealers can secure the Wire Wheel Service and Sales Agency where territory is vacant.

This new HOUSE wheel for *Fords* is rapidly gaining popularity. *Ford* owners everywhere are getting HOUSE-equipped.

List price for set of 5 wheels, 4 inner hubs, 4 hub caps, 1 hub dust cover for spare wheel, hub cap wrench and spoke nipple wrench,

White, black or red—colors optional. **$60.00**

Ford distributors and dealers in *Ford* accessories should write for our attractive sales proposition.

WIRE WHEEL CORPORATION of AMERICA
(SUCCESSORS TO HOUK MFG. CO.)
835 Eleventh Ave., at 57th Street
NEW YORK

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WHEELS, Wood (Continued)

Chicago Wheel & Rim Co., 2010-12 Wabash Ave., Chicago, Ill. (See page 763.)
Crane & MacMahon, St. Marys, O. "Acorn," "Hickory Nut."
Eames & Co., A. M., Framingham, Mass.
Eberly & Orris Mfg. Co., Mechanicsburg, Pa.
Empire Wheel Works, 610 South St., Utica, N. Y.
Harris Co., 7 Northampton St., Easthampton, Mass.
Hayes Motor Truck Wheel Co., St. Johns, Mich.
Hayes Wheel Co., Jackson, Mich.
Hickory Nut—See Crane & MacMahon.
Hoopes Bro. & Darlington, West Chester, Pa
Jones & Co., Phineas, 301 Market St., Newark, N. J.
Kelsey Wheel Co., Detroit, Mich. (See page 355.)
Kundtz Co., Theodor, Cleveland, O. (See page 105.)
Meeker Mfg. Co., Linden & Huffman Aves., Dayton, O.
Merrill, F. S., 3 Oakland St., Amesbury, Mass.
Prudden Wheel Co., 701 May St., Lansing, Mich.
Royer Wheel Co., Aurora, Ind. (See page 763.)
Salisbury Wheel & Axle Co., Jamestown, N. Y. (See page opposite Last Page.)
Schwarz Wheel Co. (Frankford), Philadelphia, Pa.
Standard Wheel Co., Terre Haute, Ind.
Wayne Wheel Co., Newark, N. Y. (See page 759.)
Wheel & Wood Bending Co., 141 John St. Bridgeport, Conn.
Zwick & Greenwald Wheel Co., Dayton, O.

WHEELS, Wood, for Fords

(For Demountable Wheels—See Wheels, Demountable)

Baltimore Hub Wheel & Mfg. Co., Gay St. & Fallsway, Baltimore, Md.
Buob & Scheu, 500-10 Webster St., Cincinnati, O. (See page 711.)
Presto Inter-Rim Co., 940 Commonwealth Ave., Boston, Mass.
Royer Wheel Co., Aurora, Ind. (See page 763.)
Salisbury Wheel & Axle Co., Jamestown, N. Y. (See page opposite Last Page.)
Schwarz Wheel Co. (Frankford), Philadelphia, Pa.
Standard Wheel Co., Terre Haute, Ind.

WHIPCORD, Upholstery

American Mills Co., 17th St. & Fourth Ave., New York, N. Y.
Laidlaw Co., 16 W. 60th St., New York, N. Y. (See page 191.)
Roy Woolen Co., Watervliet, N. Y.
Waterloo Woolen Mfg. Co., 228 E. Main St., Waterloo, N. Y.

WHISTLES, EXHAUST—See Horns, Exhaust

WICKING, Candle

Bishop Mfg. Co., Robert (S. Boston), Boston, Mass.
Estes Mills, Fall River, Mass. "Sterling."
Hoffman-Corr Mfg. Co., 594 Broadway, New York, N. Y.
Lees Mfg. Co., 820 Broadway, New York, N. Y.
Massasoit Mfg. Co., Fall River, Mass.
Sterling—See Estes Mills.
Westport Mfg. Co., Fall River, Mass.

WICKING, Felt Lubricator

(For Sheet Felt—See Felt, Sheet; for Felt Washers —See Washers, Felt)

American Felt Co., 100 Summer St., Boston, Mass. (See page 283.)
Booth Felt Co., 440-50 19th St., Brooklyn, N. Y. (See page 749.)
Brawley, T. R., 85-87 Adams St., Brooklyn, N. Y. (See page 753.)
Western Felt Works, 4115-33 Ogden Ave., Chicago, Ill.

WICKING, LUBRICATOR—See Wicking, Felt Lubricator

WICKS, Lamp

Consolidated Duck Co., 86 Worth St., New York, N. Y.
Lees Mfg. Co., 820 Broadway, New York, N. Y.

WINCHES and BLOCKS, Car Extracting

(Devices for pulling cars out of mud or sand)

Auto Accessories Co., Wheeling, W. Va. "Haberstick."
Auto Draft Co., Lake City, Minn.
Car Puller Co., Ladysmith, Wis.
Cherry—See Laurent-Cherry Pulley Block Co.
Haberstick—See Auto Accessories Co.
Keepers, J. C., 213 W. Park St., Olathe, Kans.
Laurent-Cherry Pulley Block Co., Trenton, N. J. "Cherry."
Memphis Pullblock Co., 938 Union Ave., Memphis, Tenn.
Pull-U-Out Mfg. Co., Tenth & Olive Sts., St Louis, Mo.
Rose Bros., Rosemont, Neb.

WINCHES, Truck

Bay City Foundry & Machine Co., 26th & Water Sts., Bay City, Mich.
Mead-Morrison Mfg. Co., 125 Prescott St. (E. Boston), Boston, Mass.
Otis Elevator Co., 11th Ave. & 26th St., New York, N. Y.
Truck Engineering Co., 7031 Broadway, Cleveland, O.

WIND SHIELD CLEANERS—See Cleaners, Glass Wind Shield

WIND SHIELD GLASS—See Glass, Polished Plate

WIND SHIELD HINGES—See Hinges, Wind Shield

WIND SHIELD SCREENS—See Screens, Wire Wind Shield

WIND SHIELD SPOTLIGHTS—See Lights, Spot

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WHEELS AND RIMS

WOOD AND WIRE WHEELS REPAIRED—QUICK SERVICE

All types of Rims and Rim Parts carried in stock

Stanweld, Firestone, Perlman, Kelsey

New Government Standard Size Rims Applied. Distributors for Hayes Wire Wheels

Send for complete Rim Catalog and Price List.

Manufacturers:

CHICAGO WHEEL AND RIM CO., Inc.

CHICAGO 2010-12 Wabash Ave. ILLINOIS

The Royer Wheel Company

AURORA, INDIANA

The Oldest Wheel Makers in the United States

Founded 1848

The best wood wheel made for

PLEASURE CARS
MOTOR TRUCKS
and FORD WHEELS

with demountable rims

MARVEL Auto Necessities

Vulcanizers—portable tube and casing repair kits.

Junior tube.....$1.00
Junior Patches..... 1.00
Jumbo tube..... 1.50
Jumbo Patches..... 1.00
Senior Casing..... 2.00

Gasoline tube or casing, $3.00 and $3.50.

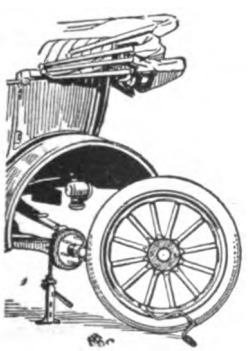
Khaki Back Patch, 25c, 50c and $1.00.

Rubber Back Patch, 50c and $1.00.

Wrenches, Windshield Cleaners, Valve Grinders, Bearings, Tire Chain Tools.

The Marvel Accessories Mfg. Co.

2011 E. 46th St. Cleveland, O.



"SIMPLICITY" DEMOUNTABLE WHEEL OUTFITS

Anyone can make the entire wheel change from punctured to good tire in FOUR minutes or less.

The Four Wheel Changes, spare 30x3 Wheel, Wheel Carrier and Speed Wrench retails for but $15, a price which is consistent with Ford costs.

One Chicago concern has installed 750 on their Ford cars during the past eight months.

Tens of thousands will be sold this year to Ford passenger and commercial car owners.

We want live jobbers and dealers. Write today for a very interesting proposition.

SIMPLICITY WHEEL CO., Grand Rapids, Mich.

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WIND SHIELD VENTILATORS—See Ventilators, Wind Shield

WIND SHIELD VISORS—See Visors, Wind Shield and Rain Shield

WIND SHIELD WEATHER STRIPS—See Strips, Wind Shield Weather

WIND SHIELD WINDOWS—See Windows, Wind Shield

WIND SHIELD WIPERS—See Cleaners, Glass Wind Shield

WIND SHIELDS—See Shields, Wind

WIND STRIPS—See trips, Wind Shield Weather

WINDINGS, Starter and Ignition

Acme Wire Co., 973 Dixwell Ave., New Haven, Conn.

Arrow Mfg. Co., 618-22 Broadway, Toledo, O.

Magneto Winding Co., 1723-25 Eighth Ave., Brooklyn, N. Y. (See page 493.)

WINDOW GLASS—See Glass, Polished Plate

WINDOWS, CURTAIN, FOR FORDS—See Lights, Curtain

WINDOW REGULATORS—See Regulators, Window

WINDOWS, CURTAIN — See Windows, Glass Curtain

WINDOWS, Glass Curtain

(Bevel glass window with metal and wood frame for use in place of celluloid lights in top curtains)

Classic—See Smith & Co.

Ideal—See Metal Stamping Co.

Johnston Mfg. Co., Wm. R., 359 E. Ohio St., Chicago, Ill. (See page 765.)

Metal Stamping Co., 13th St. & Boulevard, Long Island City, N. Y. "Ideal."

Perfection Auto Window Co., Culver City, Cal.

Smith & Co., Jos. N., E. Grand Blvd. & Dubois St., Detroit, Mich. "Classic."

WINDOWS, Wind Shield

Capitol Wind Shield Device Co., 355 Trumbull St., Hartford, Conn.

WING COATINGS, AEROPLANE—See Coatings, Aeroplane Wing; also Varnish, Aeroplane; also Paints, Aeroplane Fireproofing

WING NUTS—See Nuts, Thumb

WING SCREWS—See Screws, Thumb

WING SOCKET PLATES, AEROPLANE—See Plates, Aeroplane Wing Socket

WIPERS and POLISHING CLOTHS

(For Cotton Waste—See Waste, Cotton)

Acme Mills Co., 203 Beaubien St., Detroit, Mich.

American Manufacturing Supply Co., 297-99 Orleans St., Detroit, Mich.

American Mill Ends Co., 27 Woodward Ave., Detroit, Mich.

Arbella Waste Co., 1210 Dorchester Ave., Boston, Mass.

Baylis Sanitary Wipers Co., 312-20 N. May St., Chicago, Ill.

Cadillac Paper Co., E. Grand Blvd. & Hastings St., Detroit, Mich.

Chicago Sanitary Rag Co., 2137-43 S. Loomis St., Chicago, Ill.

Columbus Washed & Sterilized Wiper Co., 522-24 Parsons Ave., Columbus, O.

Consumers Paper Co., 316 12th St., Detroit, Mich.

Corner, Edward, 1080 Beach St., Philadelphia, Pa.

Detroit Sanitary Rag Co., 27 Woodward Ave., Detroit, Mich.

Fulton Bag & Cotton Mills, Atlanta, Ga.

Gross & Co., E., 95 Commerce St., Hartford, Conn.

Hagy Waste Works, J. Milton, 336-42 Swanson St., Philadelphia, Pa.

Hagy & Son, Clayton L. 16th & Carpenter Sts., Philadelphia, Pa.

Hoffman-Corr Mfg. Co., 594 Broadway, New York, N. Y.

Lyman Co., John R., 119 Liberty St., Springfield, Mass.

Marvel Accessories Mfg. Co., 2011 E. 46th St., Cleveland, O. (See page 763.)

Mill Remnants Co., 80 West St., New York, N. Y. "Mireco."

Mireco—See Mill Remnants Co.

North & Son, Jos. W., Sixth St., Elizabeth, N. J.

Northwestern Sanitary Wiping Rag Co., 1015 Holden St., Chicago, Ill.

Reach Textile Co., A. L., 138 Pearl St., Boston, Mass.

Robinson & Sons, D., 136-38 Napoleon St., Detroit, Mich.

Scheinman & Co., I. L., 2628 E. Grand Blvd., Detroit, Mich.

Standard Waste Mfg. Co., 2306-10 N. American St., Philadelphia, Pa.

WIRE, Aeroplane Stream Line

Spranger Wire Wheel Co., Clayton Ave., Detroit, Mich.

WIRE BELTS—See Belts, Spiral Wire

WIRE BROOMS—See Brooms, Steel Wire

WIRE CABLE—See Rope

WIRE CLOTH—See Cloth, Wire

WIRE FERRULES, AEROPLANE—See Thimbles and Ferrules, Aeroplane Wire

WIRE GAGES—See Gages, Drill and Wire

WIRE, Insulated

(Including ignition wires and cables, starter cables and wire for lighting circuits)

American Electrical Works, Phillipsdale, R. I.

American Steel & Wire Co., Chicago, Ill. "Amerite." "Americore." (See page 203.)

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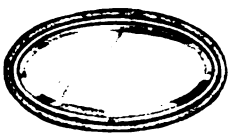
JOHNSTON
PATENTED

Johnston Curtain Windows Pay Profits that never before existed!

This clever invention—*the only successful and practical method of installing plate glass windows in flexible curtains*—has lifted the open top from a commonplace thing into a highly decorative and desirable addition to the highest class car. Twenty-nine leading automobile makers are now installing Johnston Curtain Windows of Bevel Plate Glass on one, two or all models. *More than 200,000* privately owned cars are equipped with them!

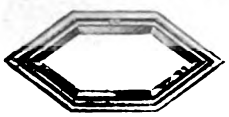
Size	Price	Size	Price
No. 4 4"	$2.00	No. 8 8"	$3.50
No. 6 6"	2.50	No. 10 10"	5.00



Size	Price
No. 12 12"x 6"	$4.50
No. 16 16"x 8"	6.00
No. 20 20"x10"	8.00

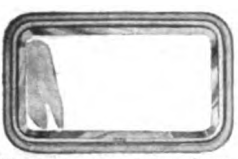
No. 30 Size 24"x6" Price $8.50

No. [illegible] Size 16" x9 Price $6.50



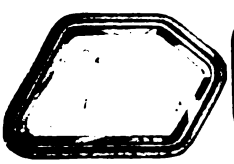
No. 26 Size 14"x6" Price $5.00

No. 22 Size 10"x7½" Price $4.75

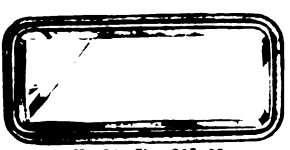


No. 34 Size 16"x9" Price $9.00

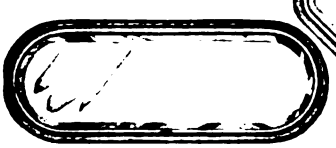
No. 58 Size 14"x9" (R & L) Price $7.00 each



No. 70 Size 15½"x9½" (R & L) Price $7.00 each



No. 36 Size 20"x8" Price $9.00



No. 44 Size 24"x8" Price $10.50

No. 74 Size 15½"x10" (R & L) Price $7.50 each

Every top trimmer, top maker, auto supply store, car dealer, garage, tent, awning and harness maker and upholsterer should avail himself of this most unusual and constantly increasing profit making opportunity. Installation can be made on any car in a few hours. Shears, a sewing machine and a tack hammer are all the equipment necessary.

Johnston Curtain Windows are fully guaranteed not to break, rattle, leak or pull out. They are a clean cut business proposition *that involves no service or comeback!*

JOHNSTON
PATENTED

This trademark on the nickel rim is your guarantee of absolute satisfaction.

At the left are shown the popular shapes in which Johnston Curtain Windows are made. You never were offered a fatter money making opportunity! The profit is handsome. And, you'll have sales and installations exceeding your rosiest expectations as quick as you pass the word you sell and install Johnston Curtain Windows of Bevel Plate Glass!

Every car you equip is a bright, shining advertisement that brings in many more!

Write or wire at once for detailed information and profit prices!

WM. R. JOHNSTON MFG. CO.
359 EAST OHIO ST., CHICAGO

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WIRE, Insulated (Continued)

Americore—See American Steel & Wire Co.
Amerite—See American Steel & Wire Co.
B. I. W.—See Boston Insulated Wire & Cable Co.
Belden Mfg. Co., 2309 S. Western Ave., Chicago, Ill.
Bishop Gutta-Percha Co., 420 E. 25th St., New York, N. Y. (See page 767.)
Boston Insulated Wire & Cable Co., Boston, Mass. "B. I. W." (See page 767.)
Bourn Rubber Co., 53 Warren St., Providence, R. I. "Star."
Crescent Insulated Wire & Cable Co., Olden Ave. & Taylor St., Trenton, N. J.
E G Mfg. Co., 250 W. 54th St., New York, N. Y. (Dealers.) (See page 215.)
Eagle—See Marion Insulated Wire & Rubber Co.
Empire Rubber & Tire Co., Mulberry St. & Clinton Ave., Trenton, N. J.
General Electric Co., Schenectady, N. Y. (See pages 564 and 565.)
Goodrich Co., B. F., S. Main St., Akron, O.
Grossman Mfg. Corp., Emil, Bush Terminal Bldg. No. 20, Brooklyn, N. Y. "Red Rib."
Habirshaw Wire Co., 1 Madison Ave., New York, N. Y.
Hazard Mfg. Co., 81 E. Ross St., Wilkes-Barre, Pa.
Indiana Rubber & Insulated Wire Co., Jonesboro, Ind. "Paranite," "Peerless."
Kerite Insulated Wire & Cable Co., 30 Church St., New York, N. Y.
M. P.—See Motor Parts Co.
Marion Insulated Wire & Rubber Co., Eighth St. & Big Four Ry., Marion, Ind. "Eagle."
Motor Parts Co., 843 N. Broad St., Philadelphia, Pa. "M. P." (See page 459.)
National India Rubber Co., Bristol, R. I.
New York Insulated Wire Co., 114 Liberty St., New York, N. Y.
Okonite Co., 253 Broadway, New York, N. Y.
Packard Electric Co., Warren, O. (See page 483.)
Paranite—See Indiana Rubber & Insulated Wire Co.
Peerless—See Indiana Rubber & Insulated Wire Co.
Red Rib—See Grossman Mfg. Corp.
Rex Ignition Mfg. Co., 250 W. 54th St., New York, N. Y.
Roebling's Sons Co., John A., S. Broad & Canal Sts., Trenton, N. J.
Rome Wire Co., Rome, N. Y. (See page 519.)
Safety Insulated Wire & Cable Co., 114 Liberty St., New York, N. Y.
Simplex Wire & Cable Co., 201 Devonshire St., Boston, Mass.
Standard Underground Cable Co.—See Zinke Co.
Star—See Bourn Rubber Co.
Zinke Co., 1323-25 Michigan Ave., Chicago, Ill. (Sole Distributors for Standard Underground Cable Co., Pittsburgh, Pa.)

WIRE, Phosphor Bronze

American Brass Co. (Benedict & Burnham Branch), Waterbury, Conn.
Omega—See Riverside Metal Co.
Phosphor Bronze Smelting Co., 2200 Washington Ave., Philadelphia, Pa.
Riverside Metal Co., Riverside, N. J. "Omega."

WIRE PROTECTORS, AEROPLANE—See Protectors, Rubber Fuselage Wire

WIRE ROPE—See Rope, Wire

WIRE ROPE CLAMPS—See Clamps, Wire Rope

WIRE SOLDER—See Solder, Bar and Wire

WIRE SPOKES—See Spokes, Wire

WIRE, SPRING—See Wire, Steel Spring

WIRE, Steel Spring

American Steel & Wire Co., Chicago, Ill. (See page 641.)
Helmuth Co., L., 17 Battery Pl., New York, N. Y. (Importers.)
Morgan Spring Co., W. Boylston St., Worcester, Mass.
Roebling's Sons Co., John A., S. Broad & Canal Sts., Trenton, N. J.
Spencer Wire Co., 80 Webster St., Worcester, Mass.
Trenton Iron Co., Trenton, N. J.

WIRE STREAMLINING, AEROPLANE—See Streamlining, Aeroplane Wire

WIRE TERMINALS—See Terminals, Wire

WIRE THIMBLES, AEROPLANE—See Thimbles and Ferrules, Aeroplane Wire

WIRE WHEELS—See Wheels, Wire

WIRING ASSEMBLIES FOR FORDS—See Sets, Wiring

WIRING CLEATS—See Cleats, Fibre Wiring

WIRING CONDUIT—See Conduit, Flexible Car Wiring

WIRING HARNESS FOR FORDS—See Sets, Wiring

WIRING, IGNITION, FOR FORDS—See Sets, Wiring

WIRING MACHINES—See Machines, Fender Wiring

WIRING SETS FOR FORDS—See Sets, Wiring

WOOD BENDING MACHINES—See Machines, Wood Bending

WOOD BENDINGS—See Bendings, Wood

WOOD BODIES—See Bodies, Wood

WOOD BORING MACHINES—See Machines, Wood Boring

WOOD DASHES—See Dashes, Wood

WOOD DOOR MOULDINGS—See Strips, Wood Door

WOOD FILLERS, AIRCRAFT—See Fillers, Aircraft Wood

WOOD MUD GUARDS—See Guards, Wood Mud

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WOOD PARTS—See Parts, Wood

WOOD PRIMERS, AIRCRAFT—See Primers, Aircraft Wood

WOOD SCREWS—See Screws, Wood

WOOD SHAPERS—See Shapers, Wood

WOOD WHEEL TIGHTENING COMPOUNDS—See Compounds, Wood Wheel Tightening

WOOD WHEELS—See Wheels, Wood

WOODWORKING MACHINERY—See Lathes, Woodworking; also Planers, Wood; also Sanders, Wood; also Saws, Band; also Saws, Circular; also Saws, Swing; also Shapers, Wood; also Trimmers, Wood

WOOL, Steel

American Steel Wool Mfg. Co., 451 Greenwich St., New York, N. Y.

Buehne Steel Wool Co., 98 Nassau St., New York, N. Y.

Rhodes & Co., James H., 157 W. Austin Ave., Chicago, Ill.

WORM DRIVE REAR AXLES—See Axles, Worm Drive Rear

WOVEN BELTS—See Belts

WRAPPING MACHINES—See Machines, Tire Bandage Wrapping

WRECKING CASTORS—See Trucks, Castors and Spare Wheels, Wrecking

WRECKING SPARE WHEELS—See Trucks, Castors and Spare Wheels, Wrecking

WRECKING TRUCKS—See Trucks, Castors and Spare Wheels, Wrecking

WRENCHES, ADJUSTABLE—See Wrenches, Nut and Bolt

WRENCHES, ALLIGATOR—See Wrenches, Nut

WRENCHES, BOLT—See Wrenches, Nut

WRENCHES, DROP FORGED—See Wrenches, Nut

WRENCHES, Grease Cup

Prismolite Co., Fourth & Gay Sts., Columbus, O.

WRENCHES, Hub Cap, for Fords

Edelmann & Co., E., 341-63 E. Ohio St., Chicago, Ill.

Metal Stamping Co., 13th St. & Boulevard, Long Island City, N. Y.

Mossberg Co., Frank, Attleboro, Mass. (See page 769.)

Nelson Mfg. Co., A., 2700 Southport Ave., Chicago, Ill.

WRENCHES, MONKEY—See Wrenches, Nut and Bolt

WRENCHES, Nut and Bolt

Agner Simplex Co.—See Hinrichs Mfg. Co.

Allan & Co., A. C., Morris, Ill.

Allen Wrench & Tool Co., Public & Eddy Sts., Providence, R. I.

Alderman—See Mossberg Co.

American Forge & Machine Co., 1425 Barth Ct., Canton, O.

American Pulley Co., 4200 Wissahickon Ave., Philadelphia, Pa.

Armstrong Bros. Tool Co., 304 N. Francisco Ave., Chicago, Ill. (See page 773.)

Art Metal Works, 7 Mulberry St., Newark, N. J. "Ronson."

Athol Machine Co., Athol, Mass.

Auto Cle—See Mossberg Co.

Auto Queen—See C. M. B. Wrench Co.

B. & C.—See Bemis & Call Hardware & Tool Co.

Barcalo Mfg. Co., 225 Louisiana Ave., Buffalo, N. Y.

Barnes Tool Co., 152 Brewery St., New Haven, Conn.

Bay State Autokit—See Cutter, Geo. A.

Becco—See Michigan Motor Specialties Co.

Bemis & Call Hardware & Tool Co., 983 Main St., Springfield, Mass. "B. & C."

Billings & Spencer Co., Laurel & Park Sts., Hartford, Conn.

Bonney Vise & Tool Works, Allentown, Pa. (See page 293.)

Bornstein & Co., Ipswich, Mass.

Braunsdorf-Mueller Co., 205 Madison St., Elizabeth, N. J.

Bridgeport Hardware Mfg. Corp., 461 Iranistan Ave., Bridgeport, Conn.

Buffum Tool Co., Louisiana, Mo. (See page 707.)

C. M. B. Wrench Co., Garwood, N. J. "Silver King," "Auto Queen."

Champion—See Syracuse Wrench Co.

Cochran Pipe Wrench Mfg. Co., 7544 S. Chicago Ave., Chicago, Ill. "Speednut."

Coes Wrench Co., Coes Sq., Worcester, Mass.

Crescent Tool Co., 204 Harrison St., Jamestown, N. Y.

Cronk & Carrier Mfg. Co., Second National Bank Bldg., Elmira, N. Y.

Cushman Auto Tool Co, Neil & Green Sts., Champaign, Ill.

Cutter, Geo. A., Taunton, Mass. "Bay State Autokit," "Stickit."

Diamond—See Ferodowill Mfg. Co.

Diamond—See Mossberg Co.

Edelmann & Co., E., 341-63 E. Ohio St., Chicago, Ill. "Sexto-Rench."

Empire—See Hjorth & Co.

Fairmount Tool & Forging Co., 10535 Quincy Ave., Cleveland, O.

Faw, J. H., 37 Warren St., New York, N. Y. (Eastern and Southern Distributor for Walden-Worcester Wrenches.) (See page 387.)

Globe Wrench Co., Ipswich, Mass.

Goodell-Pratt Co., Greenfield, Mass. (See page 751.)

Gripsall—See Mossberg Co.

Guernsey, C. C., Derry, N. H.

Harris & Reed Mfg. Co., 1510-22 W. 15th St., Chicago, Ill.

Herbrand Co., Fremont, O.

Hexall—See Sedgley, R. F.

Hill Pump Valve Co.—See Zinke Co.

Hinrichs Mfg. Co., 115 S. Dearborn St., Chicago, Ill. (Sole Distributors for Agner Simplex Co., Burlington, Wis.)

Hjorth & Co., Wm., 28 Taylor St., Jamestown, N. Y. "Empire."

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WORCESTER, MASS.

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WRENCHES, Nut and Bolt (Continued)

Holmes, George L., 1733 Broadway, New York, N. Y. (Eastern Distributor for Barcalo Wrenches.) (See page 383.)

Imperial Tool Co., Lima, O.

Indianapolis Drop Forging Co., Madison Ave. & Downing St., Indianapolis, Ind.

K & S—See Sedgley, R. F.

Keystone Mfg. Co., 41 Chandler St., Buffalo, N. Y. "Westcott."

Kilborn & Bishop Co., Chapel & Lloyd Sts., New Haven, Conn. "Saxon."

Lakeside Forge Co., Erie, Pa. (See page 755.)

Lamson & Sessions Co., 2188 Scranton Rd., Cleveland, O.

Lane, Will B., 180 N. Dearborn St., Chicago, Ill. "Unique." (See page 773.)

Lowell Wrench Co., 54 Commercial St., Worcester, Mass.

Lowentraut Mfg. Co., P., 36-54 Brenner St., Newark, N. J. "U. S."

Marvel Accessories Mfg. Co., 2011 E. 46th St., Cleveland, O. (See page 763.)

Michigan Motor Specialties Co., 26-40 Dubois St., Detroit, Mich. "Becco."

Mossberg Co., Frank, Attleboro, Mass. "Sterling," "Diamond," "Alderman," "National," "Auto Cle," "Gripsall." (See page 769.)

National—See Mossberg Co.

National Jack & Mfg. Co., 130-34 S. Clinton St., Chicago, Ill.

New Britain Mfg. Co., 216 S. Main St., New Britain, Conn.

New England Forge Co., 9 Plymouth St., Worcester, Mass.

Niagara Falls Metal Stamping Works, 245 Tenth St., Niagara Falls, N. Y. "Pokitrenchiz."

Packer Auto Specialty Co., 122 S. Michigan Ave., Chicago, Ill. "Ray."

Peck, Stow & Wilcox Co., Southington, Conn. "Pexto."

Pexto—See Peck, Stow & Wilcox Co.

Perfect Handle—See Smith & Co.

Pick-Up—See New Britain Mfg. Co.

Pokitrenchiz—See Niagara Falls Metal Stamping Works.

Ray—See Packer Auto Specialty Co.

Red Chief Mfg. Co., Louisville, Ky. "L. G."

Red Devil—See Smith & Hemenway.

Ronson—See Art Metal Works.

S. & I. Co., 55-57 Governor St., Springfield, Mass.

Saxon—See Kilborn & Bishop Co.

Schoenborn, A. J., Greenleaf, Kans.

Scholler Mfg. Co., 45 N. Division St., Buffalo, N. Y.

Sedgley, R. F., 2311-13 N. 16th St., Philadelphia, Pa. "K & S," "Hexall."

Sexto-Rench—See Edelmann & Co.

Shaw Propeller Co., 15 Elkins St. (So. Boston), Boston, Mass.

Silver King—See C. M. B. Wrench Co.

Smith & Co., H. D., Plantsville, Conn. "Perfect Handle."

Smith & Hemenway, 130 Coit St., Irvington, N. J. "Red Devil."

Speednut—See Cochran Pipe Wrench Mfg. Co.

Stadeker Metal Specialty Co., 358 W. Madison St., Chicago, Ill. (See page 271.)

Standard Tool Co., 6900-34 Central Ave., Cleveland, O.

Starrett Co., L. S., Athol, Mass.

Sterling—See Mossberg Co.

Stickit—See Cutter, Geo. A.

Syracuse Wrench Co., Syracuse, N. Y. "Champion." (See page 773.)

Trimo—See Trimont Mfg. Co.

Trimont Mfg. Co., 55 Amory St., Roxbury, Mass. "Trimo."

Turner & Deegan, Bristol, Conn.

U. S.—See Lowentraut Mfg. Co.

Unique—See Lane, Will B.

Utility—See Zinke Co.

Vichek Tool Co., 10709 Quincy Ave., Cleveland, O.

Wakefield, Clarence E., 89 Exchange St., Worcester, Mass.

Walden - Worcester, Inc., Worcester, Mass. (See pages 770 and 771.)

Whitaker Mfg. Co., 409 S. Green St., Chicago Ill.

Whitman & Barnes Mfg. Co., E. Exchange St., Akron, O.

Williams & Co., J. H., 88 Richards St., Brooklyn, N. Y. (See page 433.)

Zinke Co., 1323-25 Michigan Ave., Chicago, Ill. (Sole Distributors for Hill Pump Valve Co., Chicago, Ill. "Utility." (See page 551.)

WRENCHES, Oil Cock, for Fords

(For opening or closing crank case drain cock or oil test cock without getting under car)

Dow Wire & Iron Works, Franklin, Buchanan & Pocohontas Sts., Louisville, Ky.

E G Mfg. Co., 250 W. 54th St., New York, N. Y. (Dealers.) (See page 215.)

Faw, J. H., 37 Warren St., New York, N. Y. (See page 387.)

G. & H. Mfg. Co., 21-23 E. Fourth St., New York, N. Y. "Stay-On."

Mazura Mfg. Co., 414 S. Sixth St., St. Louis, Mo.

Nelson Mfg. Co., A., 2700 Southport Ave., Chicago, Ill.

Stadeker Metal Specialty Co., 358 W. Madison St., Chicago, Ill. (See page 271.)

Stay-On—See G. & H. Mfg. Co.

WRENCHES, OPEN END—See Wrenches, Nut

WRENCHES, Pipe

American Forge & Machine Co., 1425 Barth Ct., Canton, O.

Armstrong Mfg. Co., 335 Knowlton St., Bridgeport, Conn.

Bonney Vise & Tool Works, Allentown, Pa. "Vixen." (See page 293.)

Cochran Pipe Wrench Mfg. Co., 7544 S. Chicago Ave., Chicago, Ill.

Como—See Mechanical Specialties Co.

Empire—See Hjorth & Co.

Erie Tool Works, 640 W. 12th St., Erie, Pa.

Hjorth & Co., Wm., 28 Taylor St., Jamestown, N. Y. "Empire."

Ideal—See Kroeschell Bros. Co.

Ireland Pipe Wrench Co., 15 Court St., Boston, Mass.

Keystone Mfg. Co., 41 Chandler St., Buffalo, N. Y. "Westcott."

Kroeschell Bros. Co., 444 W. Erie St., Chicago, Ill. "Ideal."

Leader—See Ripley Pipe Wrench Co.

Lutz-Webster Engineering Co., 31st St. & Grays Ferry Rd., Philadelphia, Pa.

Mechanical Specialties Co., 122 S. Michigan Ave., Chicago, Ill. "Como."

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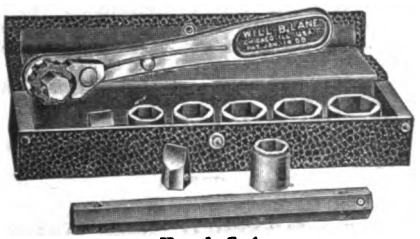

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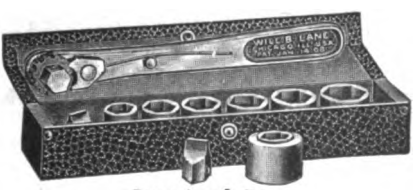

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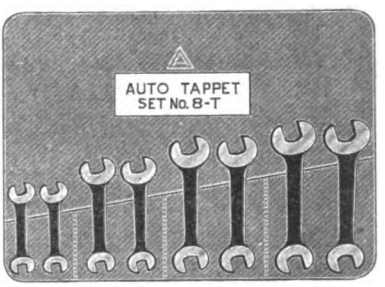

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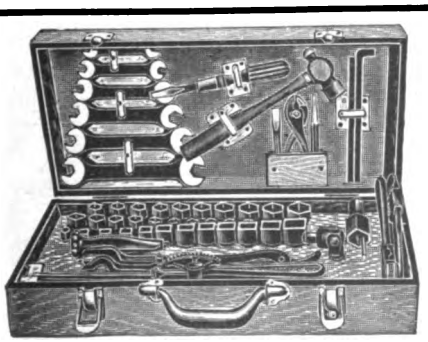

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Moore Drop Forging Co., Birnie Ave. & Walter St., Springfield, Mass.

Oswego Tool Co., 119-27 W. First St., Oswego, N. Y.

Perfect Handle—See Smith & Co.

Ripley Pipe Wrench Co., Ripley, N. Y. "Leader."

Roebling's Sons Co., John A., S. Broad & Canal Sts., Trenton, N. J.

Shaw Propeller Co., Boston, Mass.

Smith & Co., H. D., Plantsville, Conn. "Perfect Handle."

Stillson—See Walworth Mfg. Co.

Trimo—See Trimont Mfg. Co.

Trimont Mfg. Co., 55 Amory St., Roxbury, Mass. "Trimo."

Vixen—See Bonney Vise & Tool Works.

Vulcan—See Williams & Co.

Wakefield, Clarence E., 89 Exchange St., Worcester, Mass.

Walworth Mfg. Co., Boston, Mass. "Stillson."

Westcott—See Keystone Mfg. Co.

Whitaker Mfg. Co., 409 S. Green St., Chicago, Ill.

Williams & Co., J. H., 38 Richards St., Brooklyn, N. Y. "Vulcan." **(See page 433.)**

WRENCHES, REAMER — See Wrenches, Nut

WRENCHES, SOCKET—See Wrenches, Nut

WRENCHES, SOLID—See Wrenches, Nut

WRENCHES, SPARK PLUG — See Wrenches, Nut

WRENCHES, Special, for Fords

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Allen Wrench & Tool Co., Public & Eddy Sts., Providence, R. I. "Eureka."

B. A. T. Co., Germantown & Stenton Aves., Philadelphia, Pa. "Panther."

Bay State Autokit—See Cutter, Geo. A.

Billings & Spencer Co., Laurel & Park Sts., Hartford, Conn.

C. M. B. Wrench Co., Garwood, N. J.

Curko—See Graham Roller Bearing Co.

Cutter, Geo. A., Taunton, Mass. "Bay State Autokit."

Eureka—See Allen Wrench & Tool Co.

Faw, J. H., 37 Warren St., New York, N. Y. (Eastern and Southern Distributor for Walden-Worcester Wrenches.) **(See page 387.)**

G-A—See General Appliance Co.

General Appliance Co., 19th St. & Western Ave., Chicago, Ill. "G-A."

Graham Roller Bearing Co., Coudersport, Pa. "Curko."

Hill Pump Valve Co.—See Zinke Co.

Holmes, George L., 1733 Broadway, New York, N. Y. (Eastern Distributor for Curko Wrenches.) **(See page 383.)**

Improved Gauge Mfg. Co., 105 Canal St., Syracuse, N. Y. **(See page 323.)**

Lane, Will B., 180 N. Dearborn St., Chicago, Ill. "Unique." **(See page 773.)**

Mossberg Co., Frank, Attleboro, Mass. **(See page 769.)**

Nelson Mfg. Co., A., 2700 Southport Ave., Chicago, Ill.

Panther—See B. A. T. Co.

Protex Mfg. Co., 13-17 Jefferson St., Chicago, Ill. **(See page 275.)**

Unique—See Lane, Will B.

Utility—See Zinke Co.

Walden - Worcester, Inc., Worcester, Mass. **(See pages 770 and 771.)**

Williams & Co., J. H., 38 Richard St., Brooklyn, N. Y. **(See page 433.)**

Zinke Co., 1323-25 Michigan Ave., Chicago, Ill. (Sole Distributors for Hill Pump Valve Co., Chicago, Ill. "Utility." **(See page 551.)**

WRIST WATCHES, AVIATORS'—See Watches, Aviators' Wrist

WROUGHT STEEL WHEELS—See Wheels, Pressed and Wrought Steel

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SECTION 3

Reference Tables data, formulae, reports on tests and S. A. E. standards. Directory of National Trade Associations.

A complete Index to this section will be found on the pages immediately following.

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Foundry Facings
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Stevens Core Oil
Stevens Core Gum
Cupola Furnaces
Talc
Coke
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Sea Coal
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Core Ovens
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Genuine Turkish Emery
Emery Glue
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Dynamos
Voltmeters
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N. E. Branch: Frederic B. Stevens, Water and Olive, New Haven, Conn. E. C. Seeley, Mgr.

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SECTION III.

Tables and Data

Nine Horsepower Formulas

One horsepower (HP or hp) is the unit denoting the power required for raising 33,000 lb. 1 ft. in 1 minute, or 550 lb. 1 ft. in 1 second, etc. It equals very nearly 0.746 kw (kilowatt) in electric power measurement. Under the metric system 1 hp equals 0.736 kw or 75 kgm (kilogram-meters) per second. The French hp (*cheval-vapeur*), as well as the German hp (*Pferdestärke* or *Pferdekraft*), thus equals 0.9866 American or British hp or 542.48 foot-pounds per second.

The actual power capacity of an automobile, motor-boat or airplane engine is ascertained by brake-block test or by other means for offering measurable resistance to its work. The term "indicated horsepower," as used for steam engines, is not properly applicable.

A horsepower formula expressing actual power capacity approximately (for a four-cycle engine), if a good value for P is known from current engine practice and tests, may be written

$$(1)\quad \text{Horsepower} = \frac{N}{4} \times \frac{3.1416\ D^2P \times SR}{24 \times 33{,}000}$$

in which N is the number of cylinders, D the bore diameter in inches, P the mean effective pressure per square inch for the power stroke, S the stroke in inches and R the number of engine revolutions per minute. In the case of a four-cylinder engine, $\frac{N}{4}$ eliminates itself.

As piston speed, in feet per minute, equals $\frac{SR}{6}$, the stroke S receives consideration incidentally when this formula is written:

$$(2)\quad \text{Horsepower} = \frac{N}{4} \times \frac{3.1416\ D^2P \times V}{4 \times 33{,}000}$$

in which V is piston speed in feet per minute.

Using metric units, a formula corresponding to (1) is written:

$$(3)\quad \text{Horsepower} = \frac{N}{4} \times \frac{3.1416\ D^2P \times SR}{900{,}000}$$

in which N is number of cylinders, D bore diameter in cm. (centimeters), P the mean effective pressure in kg (kilograms) per square cm of piston area, S the stroke in cm, and R the number of engine revolutions per minute.

With the metric notations, piston speed c in m (meters) per second, equals $\frac{SR}{100 \times 30}$ and formula (3) can therefore also be written:

$$(4)\quad \text{Horsepower} = \frac{N}{4} \times \frac{3.1416\ D^2P \times c}{300}$$

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Nine Horsepower Formulas—Continued

These formulas are mainly useful for comparing the values for P obtained with different sizes and designs of engines and at different speeds for any given engine, the horsepower being first decided by test. In using them for determining horsepower from dimensions and design features, the difficulty is encountered that P has a fluctuating value. It includes the percentage of mechanical efficiency of the engine as a factor and is affected by compression ratio, valve sizes and lifts, valve timing, the weight of reciprocating parts and the nature of the ignition. For any given engine, P decreases after a certain speed has been reached, while the horsepower continues to be increased until the increase of speed is balanced by the reduction of P.

For classification purposes (legislation, taxation, racing rules) and rough estimates, simplified nominal horsepower formulas are used. Those relating to automobile engines of the four-cycle internal-combustion type, operated with gasoline as fuel, are of widest general interest. They are not, as a rule, directly applicable to airplane engines, Diesel or semi-Diesel engines, steam engines or to two-cycle automobile or boat engines.

Nominal and Official Horsepower Formulas for Four-Cycle Automobile and Motor Boat Engines

The most authoritative formula for the United States is that which was adopted by the Association of Licensed Automobile Manufacturers (A. L. A. M.) in the early years of the automobile industry. After the A. L. A. M. ceased to exist, the same formula was approved by the National Automobile Chamber of Commerce (N. A. C. C.). It reads:

$$(5) \quad \text{Horsepower} = \frac{D^2N}{2.5}$$

in which D is the bore diameter in inches and N the number of cylinders.

The derivation is given as follows:

The gross horsepower of a single-cylinder, four-cycle engine is equal to one-quarter times the mean effective pressure P, acting throughout the working stroke, times the area of the piston A, in square inches, times the piston speed S divided by 33,000, thus,

$$\text{Gross horsepower} = \tfrac{1}{4}\,\frac{P\,A\,S}{33{,}000}$$

Multiplying this by the number of cylinders N gives the gross horsepower for an engine of the given number of cylinders, and further multiplying by the mechanical efficiency of the engine E gives the brake horsepower. Therefore the complete equation for brake horsepower reads:

$$\text{Brake horsepower} = \frac{P\,A\,S\,N\,E}{33{,}000 \times 4}$$

The A. L. A. M. assumed that all motor car engines will deliver or should deliver their rated power at a piston speed of 1,000 feet per minute that the mean effective pressure in such engine cylinders will average 90 pounds per square inch, and that the mechanical efficiency will average 75 per cent.

Substituting these values in the above B. HP. equation, and substituting for A its equivalent, $.7854\ D^2$, the equation reads:

$$\text{Brake horsepower} = \frac{90 \times 0.7854\ D^2 \times 1{,}000 \times N \times 0.75}{33{,}000 \times 4}$$

and combining the numerical values it reduces to:

$$\text{Brake horsepower} = \frac{D^2N}{2.489}$$

or, in round numbers, with a denominator 2.5.

Another formula of American origin is one proposed by E. P. Roberts. It gives:

$$(6) \quad \text{Horsepower} = \frac{D^2LRN}{18{,}000}$$

in which D and L are bore and stroke in inches, R the number of crankshaft revolutions per minute and N the number of cylinders.

With the same connotation for D and L the Royal Automobile Club of Great Britain and the British Institution of Automobile Engineers have used the formula:

$$(7) \quad \text{Horsepower} = 0.45\ (D + L)\ (D - 1.18), \text{ for each cylinder.}$$

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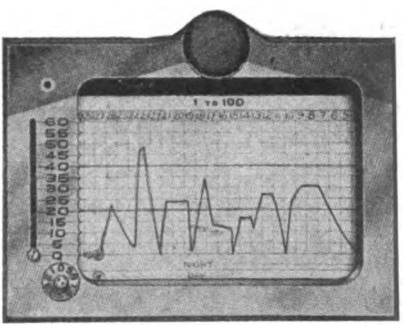

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Nine Horsepower Formulas—Continued

The official German formula by which taxation was regulated until war began in 1914 read

$$(8) \quad \text{Horsepower} = 0.3 \times id^2 s$$

in which i is the number of cylinders, d the bore diameter in cm (centimeters) and s the stroke in m (meters).

The official French formula adopted in 1912 and 1913 has:

$$(9) \quad \text{Horsepower} = Kn\ D^2 L \times omega$$

in which K is 0.00020 for single-cylinder engines, 0.00015 for 4-cylinder engines and 0.00013 for engines with more than 4 cylinders. D and L are bore in cm. (centimeters) and stroke in mm (millimeters), n is the number of cylinders, and $omega$ is the practicable maximum number of crankshaft revolutions per second on the road, the determination being subject to the best judgment of the supervising authorities, with consideration of gear ratio and other features of the vehicle in which the engine is used.

For comparison, a modern automobile engine may be rated by each of the formulas (5), (6), (7), (8) and (9) and the difference in results noted. Let the engine have the following characteristics: 4 cylinders, bore 3 inches, stroke 5 inches, mean effective pressure for three-fourths if the working stroke 130 lb., piston speed 2000 feet per minute (2400 r.p.m.), and mechanical efficiency, 75 per cent.

By formula (5) the N. A. C. C., the rating is

$$HP = \frac{36}{2.5} = 14\frac{2}{5}$$

By formula (6), the E. P. Roberts, it is

$$HP = \frac{9 \times 5 \times 2400 \times 4}{18{,}000} = 24$$

By formula (7), British I. A. E., it is

$$HP = 0.45\ (3 + 5) \times (3 - 1.18) = 3.60 \times 1.82 = 6.552$$

Multiplying by 4, the number of cylinders, gives 26.108.

By formula (8), German official, it is

$$HP = 0.3 \times 4 \times 57.76 \times 0.127 = 8.80$$

By formula (9), French official rating, it is

$$HP = 0.00015 \times 4 \times 57.76 \times 12.7 \times 30 = 13.20$$

on the basis of 1800 r.p.m., with the possibility that the rating may be ⅓ higher, or 17.60, namely of the maximum engine speed of 2400 r.p.m. is taken as the basis.

Two-Cycle Automobile and Motor Boat Engines

The two-cycle engine has twice as many working strokes as the four-cycle engine, but its horsepower is often figured from a four-cycle formula by multiplying the result by 1.65, instead of by 2, to allow for the usually lessened efficiency (especially the volumetric efficiency or ability to receive a full charge of fuel mixture) of this type at the higher speeds.

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HORSEPOWER TABLE BY N.A.C.C. (*Formerly A.L.A.M. Formula*)

In using table, find bore of cylinder in inches or millimeters in the proper left hand column, then read across to right under column for the number of cylinders that the motor under consideration has.

Bore = D		Number of Cylinders = N			
Inches	Millimeters	4	6	8	12
2½.....	64	10.00	15.00	20.00	30.00
2⅝.....	68	11.03	16.54	22.05	33.08
2¾.....	70	12.10	18.15	24.20	36.30
2⅞.....	73	13.23	19.84	26.45	39.68
3.....	76	14.40	21.60	28.80	43.20
3⅛.....	79	15.63	23.44	31.25	46.88
3¼.....	83	16.90	25.35	33.80	50.70
3⅜.....	85	18.23	27.34	36.45	54.68
3½.....	89	19.60	29.40	39.20	58.80
3⅝.....	92	21.03	31.54	42.05	63.08
3¾.....	95	22.50	33.75	45.00	67.50
3⅞.....	99	24.03	36.04	48.05	72.08
4.....	102	25.60	38.40	51.20	76.80
4⅛.....	105	27.23	40.84	54.45	81.68
4¼.....	108	28.90	43.35	57.80	86.70
4⅜.....	111	30.63	45.94	61.25	91.88
4½.....	114	32.40	48.60	64.80	97.20
4⅝.....	118	34.23	51.34	68.45	102.68
4¾.....	121	36.10	54.15	72.20	108.30
4⅞.....	124	38.03	57.04	76.05	114.08
5.....	127	40.00	60.00	80.00	120.00
5⅛.....	130	42.03	63.04	84.05	126.08
5¼.....	133	44.10	66.15	88.20	132.30
5⅜.....	137	46.23	69.34	92.45	138.68
5½.....	140	48.40	73.60	96.80	145.20
5⅝.....	143	50.63	75.94	101.25	151.88
5¾.....	146	52.90	79.35	105.80	158.70
5⅞.....	149	55.23	82.84	110.45	165.68
6.....	152	57.60	86.40	115.20	172.80

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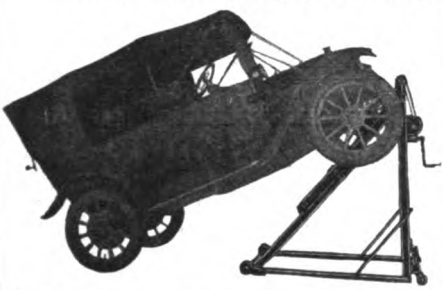

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Table of Electrical Horsepower

Volts	Amperes											
	1	10	20	30	40	50	60	70	80	90	100	110
1	.00134	.0134	.0268	.0402	.0536	.0670	.0804	.0938	.1072	.1206	.1341	.1475
5	.00670	.0670	.1341	.2011	.2681	.3351	.4022	.4692	.5362	.6032	.6703	.7373
10	.01341	.1341	.2681	.4022	.5362	.6703	.8043	.9383	1.072	1.206	1.341	1.475
15	.02011	.2011	.4022	.6032	.8043	1.005	1.206	1.408	1.609	1.810	2.011	2.212
20	.02681	.2681	.5362	.8043	1.072	1.340	1.609	1.877	2.145	2.413	2.681	2.949
25	.03351	.3351	.6703	1.005	1.341	1.676	2.011	2.346	2.681	3.016	3.351	3.686
30	.04022	.4022	.8043	1.206	1.609	2.011	2.413	2.815	3.217	3.619	4.022	4.424
35	.04692	.4692	.9384	1.408	1.877	2.346	2.815	3.284	3.753	4.223	4.692	5.161
40	.05362	.5362	1.072	1.609	2.145	2.681	3.217	3.753	4.290	4.826	5.362	5.898
45	.06032	.6032	1.206	1.810	2.413	3.016	3.619	4.223	4.826	5.439	6.032	6.635
50	.06703	.6703	1.341	2.011	2.681	3.351	4.022	4.692	5.362	6.032	6.703	7.373
75	.10054	1.005	2.011	3.016	4.021	5.027	6.032	7.037	8.043	9.048	10.05	11.06
100	.13405	1.341	2.681	4.022	5.362	6.703	8.043	9.384	10.72	12.06	13.41	14.75
500	.67025	6.703	13.41	20.11	26.81	33.51	40.22	46.92	53.62	60.32	67.03	73.73
1,000	1.3405	13.41	26.81	40.22	53.62	67.03	80.43	93.84	107.2	120.6	134.1	147.5
5,000	6.7025	67.03	134.1	201.1	268.1	335.1	402.2	469.2	536.2	603.2	670.3	737.8
10,000	13.405	134.1	268.1	402.2	536.2	670.3	804.3	938.3	1072.	1206.	1341.	1475.

Rule: $\frac{\text{Number of volts multiplied by number of amperes}}{746}$ = number of horsepowers; usually written : $\frac{VA}{746} = hp.$

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Rate of Speed from Elapsed Time and Distance

To find the rate of speed in miles per hour (m.p.h.) from total distance covered and the elapsed time, multiply distance by 60 (minutes) and divide by number of minutes elapsed time.

Example: Distance 105.5 miles; elapsed time 1 h. 53 m. 30 s. or 113 m. 30 s.:

$$60 \text{ times } 105.5 = 6330 \text{ and } \frac{6330}{113.5} = \frac{63{,}300}{1135} = 55.8 \text{ m.p.h.}$$

Seconds are turned into a decimal fraction of a minute (for convenience in dividing) by dividing their number by 6 and writing the quotient as a decimal, one decimal being ordinarily sufficiently accurate for figuring m.p.h.

For complete accuracy in figuring m.p.h. from distance and elapsed time, multiply distance by 3600 and divide the product by the elapsed time in seconds.

Speed Rules for Measured One Mile or One Kilometer

The preceding general rule for figuring m.p.h. from the distance and the time, in minutes or seconds, is further simplified when the distance in question is the unit—1 mile or 1 kilometer. In either case, divide 3600 by the number of seconds elapsed, to find the rate of speed in m.p.h. or km.p.h., respectively.

General rule: When m. $\left\{\begin{matrix}\text{miles}\\ \text{kilometers}\end{matrix}\right\}$ are covered in n seconds, the speed in $\left\{\begin{matrix}\text{m.p.h.}\\ \text{km.p.h.}\end{matrix}\right\}$ is

$$\frac{3600}{n} \times m$$

The following two tables give the speed in m.p.h. (or km.p.h.) for measured mile (or kilometer) made in from 24 seconds to 3 minutes.

Speed in Miles or Kilometers per Hour Corresponding to Any Elapsed Time from 24 Seconds to 59⅘ Seconds for 1 Measured Mile or Kilometer, Progressing by ⅕ Second.

Time for One Mile or One Kilometer, Seconds	Equal to Miles or Kilometers per Hour	Time for One Mile or One Kilometer, Seconds	Equal to Miles or Kilometers per Hour	Time for One Mile or One Kilometer, Seconds	Equal to Miles or Kilometers per Hour	Time for One Mile or One Kilometer, Seconds	Equal to Miles or Kilometers per Hour	Time for One Mile or One Kilometer, Seconds	Equal to Miles or Kilometers per Hour	Time for One Mile or One Kilometer, Seconds	Equal to Miles or Kilometers per Hour
24	150.00	30	120.00	36	100.00	42	85.71	48	75.00	54	66.66
⅕	148.76	⅕	119.20	⅕	99.44	⅕	85 30	⅕	74.68	⅕	66.42
⅖	147.54	⅖	118.42	⅖	98.90	⅖	84.90	⅖	74.38	⅖	66.17
⅗	146.34	⅗	117.64	⅗	98.36	⅗	84.50	⅗	74.07	⅗	65.93
⅘	145.16	⅘	116.88	⅘	97.82	⅘	84.11	⅘	73.77	⅘	65.69
25	144.00	31	116.13	37	97.29	43	83.72	49	73.47	55	65.45
⅕	142.86	⅕	115.38	⅕	96.77	⅕	83.33	⅕	73.17	⅕	65.21
⅖	141.73	⅖	114.65	⅖	96.25	⅖	82.95	⅖	72.87	⅖	64.98
⅗	140.62	⅗	113.90	⅗	95.74	⅗	82.57	⅗	72.58	⅗	64.74
⅘	139 53	⅘	113.21	⅘	95 23	⅘	82.19	⅘	72.29	⅘	64.51
26	138.46	32	112.50	38	94.73	44	81.81	50	72.00	56	64.28
⅕	137.40	⅕	111.80	⅕	94.24	⅕	81.44	⅕	71.71	⅕	64.05
⅖	136.36	⅖	111 11	⅖	93.75	⅖	81.08	⅖	71.42	⅖	63.83
⅗	135.34	⅗	110.43	⅗	93.26	⅗	80.71	⅗	71.14	⅗	63.60
⅘	134.33	⅘	109.75	⅘	92.78	⅘	80.35	⅘	70.86	⅘	63.38
27	133.33	33	109 09	39	92.30	45	80.00	51	70.58	57	63.16
⅕	132.25	⅕	108.43	⅕	91.83	⅕	79.64	⅕	70.31	⅕	62.93
⅖	131.38	⅖	107.78	⅖	91.37	⅖	79.29	⅖	70.04	⅖	62.71
⅗	130.43	⅗	107.14	⅗	90.91	⅗	78.94	⅗	69.76	⅗	62.50
⅘	129.50	⅘	106151	⅘	90.45	⅘	78.60	⅘	69.49	⅘	62.28
28	128.57	34	105.88	40	90.00	46	78.26	52	69.23	58	62.07
⅕	127.66	⅕	105.26	⅕	89.55	⅕	77.92	⅕	68.96	⅕	61.85
⅖	126.76	⅖	104.65	⅖	89.11	⅖	77.58	⅖	68.70	⅖	61.64
⅗	125.87	⅗	104.04	⅗	88.67	⅗	77.25	⅗	68.44	⅗	61.43
⅘	125.00	⅘	103.45	⅘	88.23	⅘	76.92	⅘	68.18	⅘	61.22
29	124.13	35	102.85	41	87.80	47	76.59	53	67.92	59	61.01
⅕	123.28	⅕	102.27	⅕	87.38	⅕	76.27	⅕	67.66	⅕	60.81
⅖	122.45	⅖	101.69	⅖	86.95	⅖	75.95	⅖	67.41	⅖	60.60
⅗	121.62	⅗	101.12	⅗	86.53	⅗	75.63	⅗	67.16	⅗	60.40
⅘	120.80	⅘	100.56	⅘	86.12	⅘	75.31	⅘	66.91	⅘	60.20

To convert miles into kilometers, multiply the miles by 1.6093.
To convert kilometers into miles, multiply the kilometers by 0.6214.

Index to Tables and Data appears on Pages 777 and 778.

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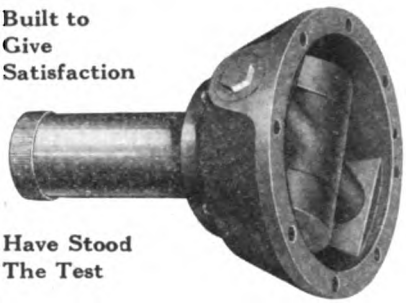

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Speed in Miles or Kilometers per Hour for an Elapsed Time of from 1 to 3 Minutes Over a Measured Mile or Kilometer

Time Over Measured Mile or Kilometer		Rate of Speed in Miles or Kilometers per Hour	Time Over Measured Mile or Kilometer		Rate of Speed in Miles or Kilometers per Hour	Time Over Measured Mile or Kilometer		Rate of Speed in Miles or Kilometers per Hour
Min.	Sec.		Min.	Sec.		Min.	Sec.	
1	0	60.00	1	27	41.38	1	54	31.58
1	1	59.00	1	28	40.91	1	55	31.30
1	2	58.06	1	29	40.45	1	56	31.03
1	3	57.14	1	30	40.00	1	57	30.77
1	4	56.25	1	31	39.56	1	58	30.50
1	5	55.38	1	32	39.13	1	59	30.25
1	6	54.54	1	33	38.71	2	0	30.00
1	7	53.73	1	34	38.29	2	3	29.26
1	8	52.94	1	35	37.89	2	6	28.57
1	9	52.17	1	36	37.50	2	9	27.90
1	10	51.42	1	37	37.11	2	12	27.27
1	11	50.70	1	38	36.73	2	15	26.66
1	12	50.00	1	39	36.36	2	18	26.08
1	13	49.31	1	40	36.00	2	21	25.53
1	14	48.65	1	41	35.64	2	24	25.00
1	15	48.00	1	42	35.29	2	27	24.49
1	16	47.37	1	43	34.95	2	30	24.00
1	17	46.75	1	44	34.61	2	33	23.53
1	18	46.15	1	45	34.28	2	36	23.07
1	19	45.57	1	46	33.96	2	39	22.64
1	20	45.00	1	47	33.64	2	42	22.22
1	21	44.44	1	48	33.33	2	45	21.81
1	22	43.90	1	49	33.03	2	48	21.42
1	23	43.37	1	50	32.72	2	51	21.05
1	24	42.85	1	51	32.43	2	54	20.69
1	25	42.35	1	52	32.14	3	0	20.00
1	26	41.86	1	53	31.86	..	..	.....

Speed Equivalents for 1 Mile and 1 Kilometer

1 mile per hour = 88 ft. per minute.
= 1.46 ft. per second.
= 27.8 metres per minute.
= 0.463 metre per second.
1 km. per hour = 0.6214 miles per hour.
= 54.9 ft. per minute.
= 0.288 metre per second.

Index to Tables and Data appears on Pages 777 and 778.

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If ever an opportunity to increase your business was offered you—here it is.

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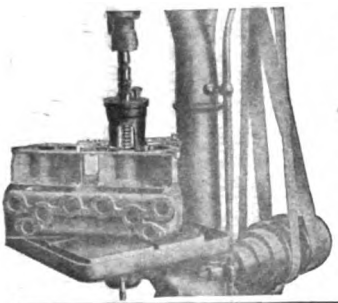

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Relations between the Speed of a Car and the Number of Revolutions per Minute of the Road Wheels

To find the number of r.p.m. of road wheels, divide the speed in m.p.h. by diameter of wheel in inches and multiply by 336.134.

To find m.p.h. of car, multiply r.p.m. of road wheel by wheel diameter in inches and divide by 336.134.

These rules are derived as follows: 1 m.p.h. equals 88 ft. per minute, or 12×88 inches ($= 1056$ inches) per minute. The circumference of the road wheel, if its diameter in inches is D, is $D\pi$ and $\pi = 3.1416$. Therefore:

$$\text{Number of r.p.m.} = \frac{\text{Number of m.p.h.}}{D} \times \frac{1056}{3.1416} = \frac{\text{Number of m.p.h.}}{D} \times 336.134$$

The accompanying table gives the equivalents of m.p.h. in feet per minute, and applies the rules, as given above, to road wheels from 24 to 44 inches and for speeds up to 40 m.p.h.

Miles per Hour	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	22	24	26	28	30	35	40
Feet per Minute	88	176	264	352	440	528	616	704	792	880	968	1,056	1,144	1,232	1,320	1,418	1,496	1,584	1,672	1,760	1,936	2,112	2,288	2,464	2,640	3,080	3,520
Wheel Diameters in Inches: 24	14	28	42	56	70	84	98	112	126	140	154	168	182	196	210	224	238	252	266	280	308	336	364	392	420	490	560
26	12.92	21.84	38.76	51.69	63.61	77.53	90.46	103.38	116.30	129.23	142.15	155.07	168	180.92	193.84	206.76	219.69	232.61	245.53	258.46	284.30	310.15	336	361.84	397.69	452.30	516.92
28	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	264	288	312	336	360	420	480
30	11.2	22.4	33.6	44.8	56	67.2	78.4	89.6	100.8	112	123.2	134.4	145.6	156.8	168	179.2	190.4	201.6	212.8	224	246.4	268.8	291.2	313.6	336	392	448
32	10.5	21	31.5	42	52.5	63	73.5	84	94.5	105	115.5	126	136.5	147	157.5	168	178.5	189	199.5	210	231	252	273	294	315	367.5	420
34	9.88	19.70	29.64	39.52	49.41	59.29	69.17	79.05	88.94	98.82	108.70	118.58	128.47	138.35	148.23	158.11	168	177.88	187.76	197.64	217.41	237	256.94	276.70	296.47	345.88	395.29
36	9.33	18.66	28	37.33	46.66	56	65.33	74.66	84	93.33	102.66	112	121.33	130.66	140	149.33	158.66	168	177.33	186.66	205.33	224	242.66	261.33	280	326.66	373.33
38	8.8	17.68	26.52	35.36	44.21	53.05	61.89	70.73	79.57	88.42	97.27	106.10	114.94	123.78	132.63	141.47	150.31	159.15	168	176.84	194.52	212.21	238.89	247.57	265.26	309.21	353.42
40	8.4	16.8	25.2	33.6	42	50.4	58.8	67.2	75.6	84	2.4	100.8	109.2	117.6	126	134.4	142.8	151.2	159.6	168	184.8	201.6	218.4	235.2	252	294	336
42	8	16	24	32	40	48	56	64	72	80	88	96	104	112	120	128	136	144	152	160	176	192	208	224	240	280	320
44	7.63	15.27	22.10	30.54	38.18	45.81	53.45	61.09	68.72	76.36	84	91.63	99.24	106.10	114.54	123.18	129.81	137.45	145.09	156.72	168	183.27	198.54	213.81	229.09	267.27	305.45

Wheel diameters include tires. It is commonly believed that with soft-inflated air tires r.p.m. is increased and m.p.h. is reduced, perhaps up to 3 per cent on rough roads. With worn-down solid tires the actual diameter should be measured.

Index to Tables and Data appears on Pages 777 and 778.

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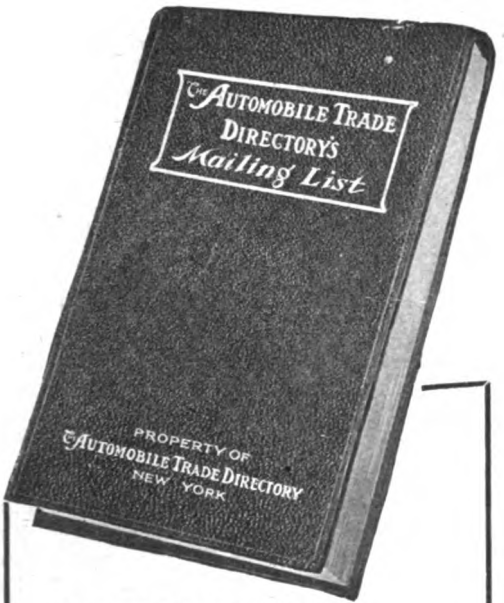
Here is a real "War-Time" Mailing List of the Automobile Industry



It is divided into Three Sections.

Section 1
The names of all Automobile, Commercial Vehicle, Tractor and Motor Manufacturers, together with the names and initials of their purchasing Agents, Engineers, Superintendents and other officials.

Section 2
The names and addresses of all Jobbers and Exclusive Supply Houses handling Automobile Accessories, including hardware, electrical, sporting goods and mill supply dealers. The following information is given regarding them:

1—Main line handled.
2—Number of salesmen traveled.
3—Territory covered.
4—Amount of stock carried.
5—Percentage of business, wholesale, retail and mail order.
6—Buyer's name.
7—Whether a catalog is issued.

Section 3
All legitimate Dealers (giving the cars and trucks handled), Garages and Repair Shops. All concerns in this section who have a supply department are specially designated.

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In the automobile industry there were over 40,000 changes during the past year—in this count are included 10,778 concerns who went out of the trade while 10,322 new concerns came in.

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Estimating Speed from Wheel Diameter

What is speed in m.p.h. at 1000 r.p.m. of engine with road wheels of different sizes? Assumed: the use of direct gear and a 3/1 bevel-gear ratio; also a speed reduction of 3 per cent due to tire compression and slip.

Answer: If d is wheel diameter in inches (reduced to feet by dividing by 12), one has (since 88 ft. per minute equals 1 m.p.h.):

$$\text{Number of m.p.h.} = \frac{d\pi \times 1000}{3 \times 12 \times 88} = \frac{d \times 3141.6}{3168} = d - 1\% \text{ (approx.)}$$

The m.p.h. thus equal the wheel diameter in inches minus 4 per cent, with the 3 per cent allowance for tire action, and a 3/1 gear ratio.

Similarly, for a 1/1 ratio (old type racing car) the m.p.h. equals $3\,d - 4$ per cent.

From this, the m.p.h. obtained with any other ratio of total reduction is easily found by reducing $3\,d$ correspondingly and deducting 4 per cent. A 12/1 ratio (representing low gear, for example) gives $\frac{3}{12}\,d - 4$ per cent.

For other engine speeds than 1000 r.p.m., increase or reduce in proportion.

The following table shows the approximate speed in m.p.h. for different wheel diameters and gear ratios, at 1000 r.p.m. of engine.

Gears	12:1	9:1	7:1	5:1	4:1	3½:1	3:1	2½:1	2:1	1:1
30-in. wheel.....	7.2	9.6	12.3	17.3	21.6	24.7	28.8	34.6	43.2	86.4
32-in. wheel.....	7.7	10.2	13.2	18.4	23.1	26.4	30.7	36.8	46.1	92.2
33-in. wheel.....	7.9	10.6	13.6	19.0	23.8	27.2	31.7	38.0	47.5	95.0
34-in. wheel.....	8.2	10.9	13.9	19.6	24.5	27.9	32.6	39.2	49	97.9
36-in. wheel.....	8.6	11.5	14.8	20.7	25.9	29.6	34.6	41.4	51.9	103.7
38-in. wheel.....	9.1	12.2	15.6	21.9	27.4	31.2	36.5	43.8	54.7	109.4
40-in. wheel.....	9.6	12.8	16.5	23.0	28.8	32.9	38.4	46.0	57.6	115.2
42-in. wheel.....	10.1	13.4	17.3	24.2	30.3	34.6	40.3	48.4	60.5	121.0
44-in. wheel.....	10.6	14.1	18.1	25.3	31.7	36.2	42.2	50.6	63.4	126.7

Useful Functions of π

π is the only completely established and universally accepted Greek-letter symbol in geometry, signifying how much longer the circumference of a circle is than its diameter; periphery of circle $= \pi$ multiplied by diameter of circle. It is constantly used for determining dimensions of lines, areas and volumes in which circles or areas of circles are a feature. The numerical values of the most frequently occurring combinations of π are given in the following table:

$\pi = 3.14159265$	$\frac{\pi}{7} = 0.44879895$	$\pi^2 = 9.86960440$	$\sqrt{\pi} = 1.77245385$
$\frac{\pi}{2} = 1.57079633$	$\frac{\pi}{16} = 0.19634954$	$\pi^3 = 31.00627668$	$\sqrt[3]{\pi} = 1.46459189$
$\frac{\pi}{3} = 1.04719755$	$\frac{\pi}{24} = 0.13089969$	$\frac{1}{\pi} = 0.31830989$	$\frac{1}{\sqrt{\pi}} = 0.56418958$
$\frac{\pi}{4} = 0.78539816$	$\frac{\pi}{32} = 0.09817477$	$\frac{1}{\pi^2} = 0.10132118$	$\frac{1}{\sqrt[3]{\pi}} = 0.68278406$
$\frac{\pi}{6} = 0.52359878$	$\frac{\pi}{180} = 0.01754329$	$\frac{1}{\pi^3} = 0.03225153$	$\text{Log } \pi = 0.49714987$

Gasoline of 64° Beaumé has a specific gravity of .72, and consequently weighs 5.96 pounds per gallon.

A British Thermal Unit represents the amount of heat required to raise the temperature of one pound of water one degree Fahrenheit at or near 39° F. Its symbol is B. T. U.

There are 778 foot-pounds in a B. T. U. and 42.4 B. T. U. to a horsepower.

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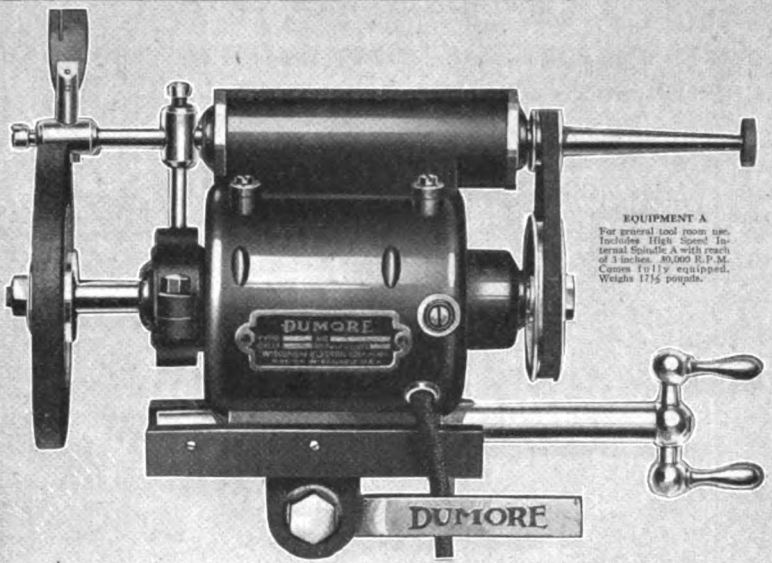

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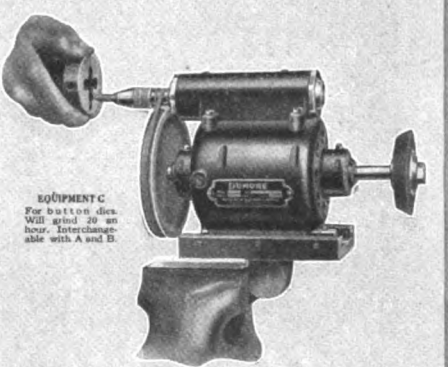
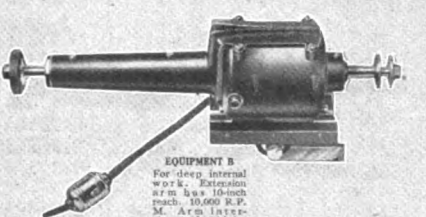


EQUIPMENT C
For button dies. Will grind 20 an hour. Interchangeable with A and B.



EQUIPMENT B
For deep internal work. Extension arm has 10-inch reach. 10,000 R.P.M. Arm interchangeable with internal spindle on Equipment A.

DUMORE HIGH SPEED GRINDERS

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Table for Division of Circles

Length of chord for angle $a = 2r \sin\frac{a}{2}$ Table is figured for r (being the radius of the circle) = 1. For other values of r, multiply by r.

Number of Divisions in Circumference	Angle of Each Division in Degrees and Minutes	Length of Chord for Each Division (for Radius = 1)	Number of Divisions in Circumference	Angle of Each Division in Degrees and Minutes	Length of Chord for Each Division (for Radius = 1)
3	120 deg.	1.73206	42	8 deg. 34 min.	0.14938
4	90 deg.	1.41422	43	8 deg. 22 min.	0.1459
5	72 deg.	1.17558	44	8 deg. 10 min.	0.14242
6	60 deg.	1	45	8 deg.	0.13952
7	51 deg. 25 min.	0.86732	46	7 deg. 49 min.	0.13603
8	45 deg.	0.76536	47	7 deg. 39 min.	0.133128
9	40 deg.	0.68404	48	7 deg. 30 min.	0.130806
10	36 deg.	0.61804	49	7 deg. 20 min.	0.127904
11	32 deg. 43 min.	0.563	50	7 deg. 12 min.	0.125582
12	30 deg.	0.51764	51	7 deg. 3 min.	0.122678
13	27 deg.	0.4782	52	6 deg. 55 min.	0.120356
14	25 deg.	0.4448	53	6 deg. 47 min.	0.118032
15	24 deg.	0.41582	54	6 deg. 40 min.	0.11629
16	22 deg. 30 min.	0.39018	55	6 deg. 32 min.	0.113966
17	21 deg. 10 min.	0.36734	56	6 deg. 25 min.	0.111644
18	20 deg.	0.3473	57	6 deg. 18 min.	0.1099
19	18 deg. 56 min.	0.32894	58	6 deg. 12 min.	0.108158
20	18 deg.	0.31286	59	6 deg. 06 min.	0.106414
21	17 deg. 08 min.	0.29792	60	6 deg.	0.104672
22	16 deg. 21 min.	0.2841	61	5 deg. 54 min.	0.102928
23	15 deg. 39 min.	0.272	62	5 deg. 48 min.	0.101186
24	15 deg.	0.26106	63	5 deg. 42 min.	0.099442
25	14 deg. 24 min.	0.25066	64	5 deg. 37 min.	0.0977
26	13 deg. 50 min.	0.24086	65	5 deg. 32 min.	0.096538
27	13 deg. 20 min.	0.23218	66	5 deg. 27 min.	0 094794
28	12 deg. 51 min.	0.22352	67	5 deg. 22 min.	0.093632
29	12 deg. 24 min.	0.216	68	5 deg. 17 min.	0.091888
30	12 deg.	0.20906	69	5 deg. 13 min.	0.090765
31	11 deg. 36 min.	0.20212	70	5 deg. 8 min.	0.089564
32	11 deg. 15 min.	0.19574	71	5 deg. 4 min.	0.088402
33	10 deg. 54 min.	0 18996	72	5 deg.	0.087238
34	10 deg. 35 min.	0.18416	73	4 deg. 55 min.	0.085496
35	10 deg. 17 min.	0.17894	74	4 deg. 51 min.	0.084332
36	10 deg.	0.17432	75	4 deg. 48 min.	0.083752
37	9 deg. 43 min.	0.1691	76	4 deg. 44 min.	0.083588
38	9 deg. 28 min.	0.16504	77	4 deg. 40 min.	0.081426
39	9 deg. 13 min.	0.1604	78	4 deg. 36 min.	0.080264
40	9 deg.	0.15692	79	4 deg. 33 min.	0.0791
41	8 deg. 46 min.	0.15286	80	4 deg. 30 min.	0.078518

(*Continued on following page*)

Index to Tables and Data appears on Pages 777 and 778.

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It may be Installed in a Few Minutes on Any Make of Car Using Vacuum Fuel Feed.

This is a talk to dealers concerning the Masters Gasoline Meters which opens up an entirely new field for quick sales and good profits.

How often have you heard a car-owner say: "I think I'm getting about 16 miles to the gallon"—or that his carburetor is not what it used to be, and so he suggests that perhaps he had better buy a new one. Then there's the fellow who knows that his gas bills are mounting higher every month, but can't just lay his finger on the trouble.

Suppose you could say to these car-owners: "Here gentlemen is an instrument that will tell you, not only how much gas your motor is consuming, but it will notify you when your car is dropping below its standard of efficiency.

"For example—it will tell you when your valves need grinding—when your carburetor needs more air or less gas. If your brakes are binding, this little instrument will say—'look out, something is wrong—stop and investigate.'"

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because the "Masters Gasoline Meter" will do all that we stated above—and more.

Now get busy and whenever a car-owner comes into your store whose car is equipped with a Vacuum Feed—don't let him get away without selling him a Masters Gasoline Meter.

We have lately added 50 dealers to our list who are selling these meters and clearing a good profit. Write us today for our terms to the trade or send your order to our nearest distributor.

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Table for Division of Circles—(Continued)

Number of Divisions in Circumference	Angle of Each Division in Degrees and Minutes	Length of Chord for Each Division (for Radius = 1)	Number of Divisions in Circumference	Angle of Each Division in Degrees and Minutes	Length of Chord for Each Division (for Radius = 1)
81	4 deg. 26 min.	0.077356	91	3 deg. 57 min.	0.0686362
82	4 deg. 23 min.	0.076194	92	3 deg. 54 min.	0.0680546
83	4 deg. 20 min.	0.075612	93	3 deg. 52 min.	0.0674732
84	4 deg. 17 min.	0.07445	94	3 deg. 49 min.	0.0663104
85	4 deg. 14 min.	0.073868	95	3 deg. 47 min.	0.0657288
86	4 deg. 11 min.	0.072706	96	3 deg. 45 min.	0.0651474
87	4 deg. 8 min.	0.072124	97	3 deg. 42 min.	0.064566
88	4 deg. 5 min.	0.070962	98	3 deg. 40 min.	0.0639844
89	4 deg. 2 min.	0.07038	99	3 deg. 38 min.	0.063403
90	4 deg.	0.069798	100	3 deg. 36 min.	0.0628216

This table should be useful for gear and chain wheel calculation and design.

Length of arc of a degrees $= 2r\pi\frac{a}{360}$

Area of sector of a degrees $= r^2\pi\frac{a}{360}$

Area of segment of a degrees = area of sector minus area of triangle $= r^2\pi\frac{a}{360} - \frac{r^2}{2}\sin a =$

$r^2\left(\frac{a \times 3.1416}{360} - \sin a\right)$

Compound Equivalents

1 atmosphere (14.7 lbs. per square inch) = 1.0335 kilogrammes per square centimetre.

1 lb. per square inch = 0.0703077 kilogramme per square centimetre = 0.7031 gramme per square millimetre = 5.170 centimetres of mercury at 0 degress Centigrade.

1 kilogramme per square millimetre = 1422.32 lbs. per square inch = 0.635 ton per square inch

1 kilogramme per square centimetre = 14.2232 lbs. per square inch.

1 gramme per square millimetre = 1.422 lbs. per square inch.

1 gramme per square centimetre = 0.01422 lb. per square inch.

1 calorie or French unit of heat = 3.968 British Thermal Units.

1 calorie per square metre = 0.369 heat-unit per square foot.

1 calorie per kilogramme = 1.800 heat-units per lb.

Index to Tables and Data appears on Pages 777 and 778.

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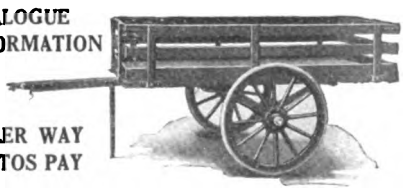

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Circumferences and Areas of Circles

Diameters from 1-64 inch to 63 inches

Diam.	Circum.	Area	Diam.	Circum.	Area	Diam.	Circum.	Area
1/64	.04909	.00019	2	6.2832	3.1416	5	15.708	19.635
1/32	.09818	.00077	1/16	6.4795	3.3410	1/16	15.904	20.129
3/64	.14726	.00173				1/8	16.101	20.629
			1/8	6.6759	3.5466			
1/16	.19635	.00307	3/16	6.8722	3.7583	3/16	16.297	21.135
3/32	.29452	.00690	1/4	7.0686	3.9761	1/4	16.493	21.648
1/8	.39270	.01227				5/16	16.690	22.166
			5/16	7.2649	4.2000			
5/32	.49087	.01917	3/8	7.4613	4.4301	3/8	16.886	22.691
3/16	.58905	.02761	7/16	7.6576	4.6664	7/16	17.082	23.221
7/32	.68722	.03758				1/2	17.279	23.758
			1/2	7.8540	4.9087			
1/4	.78540	.04909	9/16	8.0503	5.1572	9/16	17.475	24.301
9/32	.88357	.06213	5/8	8.2467	5.4119	5/8	17.671	24.850
5/16	.98175	.07670				11/16	17.868	25.406
			11/16	8.4430	5.6727			
11/32	1.0799	.09281	3/4	8.6394	5.9396	3/4	18.064	25.967
3/8	1.1781	.11045	13/16	8.8357	6.2126	13/16	18.261	26.535
13/32	1.2763	.12962				7/8	18.457	27.109
			7/8	9.0321	6.4918			
7/16	1.3744	.15033	15/16	9.2284	6.7771	15/16	18.653	27.688
15/32	1.4726	.17257	3	9.4284	7.0686	6	18.850	28.274
1/2	1.5708	.19635				1/8	19.242	29.465
			1/16	9.6211	7.3662			
17/32	1.6690	.22166	1/8	9.8175	7.6699	1/4	19.635	30.680
9/16	1.7671	.24850	3/16	10.014	7.9798	3/8	20.028	31.919
19/32	1.8653	.27688				1/2	20.420	33.183
			1/4	10.210	8.2958			
5/8	1.9635	.30680	5/16	10.407	8.6179	5/8	20.813	34.472
21/32	2.0617	.33824	3/8	10.603	8.9462	3/4	21.206	35.785
11/16	2.1598	.37122				7/8	21.598	37.122
			7/16	10.799	9.2806			
23/32	2.2580	.40574	1/2	10.996	9.6211	7	21.991	38.485
3/4	2.3562	.44179	9/16	11.192	9.9678	1/8	22.384	39.871
25/32	2.4544	.47937				1/4	22.776	41.282
			5/8	11.388	10.321			
13/16	2.5525	.51849	11/16	11.585	10.680	3/8	23.169	42.718
27/32	2.6507	.55914	3/4	11.781	11.045	1/2	23.562	44.179
7/8	2.7489	.60132				5/8	23.955	45.664
			13/16	11.977	11.416			
29/32	2.8471	.64504	7/8	12.174	11.793	3/4	24.347	47.173
15/16	2.9452	.69029	15/16	12.370	12.177	7/8	24.740	48.707
31/32	3.0434	.73708				8	25.133	50.265
			4	12.566	12.566			
1	3.1416	.7854	1/16	12.763	12.962			
1/16	3.3379	.8866	1/8	12.959	13.364	1/8	25.525	51.849
1/8	3.5343	.9940				1/4	25.918	53.456
3/16	3.7306	1.1075	3/16	13.155	13.772	3/8	26.311	55.088
			1/4	13.352	14.186			
1/4	3.9270	1.2272	5/16	13.548	14.607	1/2	26.704	56.745
5/16	4.1233	1.3530				5/8	27.096	58.426
3/8	4.3197	1.4849	3/8	13.744	15.033	3/4	27.489	60.132
7/16	4.5160	1.6230	7/16	13.941	15.466	7/8	27.882	61.862
			1/2	14.137	15.904			
1/2	4.7124	1.7671				9	28.274	63.617
9/16	4.9087	1.9175	9/16	14.334	16.349	1/8	28.667	65.397
5/8	5.1051	2.0739	5/8	14.530	16.800	1/4	29.060	67.201
11/16	5.3014	2.2365	11/16	14.726	17.257	3/8	29.452	69.029
3/4	5.4978	2.4053	3/4	14.923	17.728	1/2	29.845	70.882
13/16	5.6941	2.5802	13/16	15.119	18.190	5/8	30.238	72.760
7/8	5.8905	2.7612	7/8	15.315	18.665	3/4	30.631	74.662
15/16	6.0868	2.9483	15/16	15.512	19.147	7/8	31.023	76.589

(*Continued on following page*)

Index to Tables and Data appears on Pages 777 and 778.

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Circumferences and Areas of Circles—(Continued)

Diam.	Circum.	Area	Diam.	Circum.	Area	Diam.	Circum.	Area
10	31.416	78.540	15 ⅝	49.480	194.83	21 ⅝	68.330	371.54
			¾	49.873	197.93	¾	68.722	375.83
⅛	31.809	80.516	16	50.265	201.06	22	69.115	380.13
¼	32.201	82.516						
⅜	32.594	84.541	⅛	50.658	204.22	⅛	69.508	384.46
			¼	51.051	207.39	¼	69.900	388.82
½	32.987	86.590	⅜	51.444	210.60	⅜	70.293	393.20
⅝	33.379	88.664						
¾	33.772	90.763	½	51.836	213.82	½	70.686	397.61
			⅝	52.229	217.08	⅝	71.079	402.04
⅞	34.165	92.886	¾	52.622	220.35	¾	71.471	406.49
11	34.558	95.033						
⅛	34.950	97.205	⅞	53.014	223.65	⅞	71.864	410.97
			17	53.407	226.98	23	72.257	415.48
¼	35.343	99.402	⅛	53.800	230.33	⅛	72.649	420.00
⅜	35.736	101.62						
½	36.128	103.87	¼	54.192	233.71	¼	73.042	424.56
			⅜	54.585	237.10	⅜	73.435	429.13
⅝	36.521	106.14	½	54.978	240.53	½	73.827	433.74
¾	36.914	108.43						
⅞	37.306	110.75	⅝	55.371	243.98	⅝	74.220	438.36
			¾	55.763	247.45	¾	74.613	443.01
12	37.699	113.10	⅞	56.156	250.95	⅞	75.006	447.69
⅛	38.092	115.47						
¼	38.485	117.86	18	56.549	254.47	24	75.398	452.39
			⅛	56.941	258.02	⅛	75.791	457.11
⅜	38.877	120.28	¼	57.334	261.59	¼	76.184	461.86
½	39.270	122.72						
⅝	39.663	125.19	⅜	57.727	265.18	⅜	76.576	466.64
			½	58.119	268.80	½	76.969	471.44
¾	40.055	127.68	⅝	58.512	272.45	⅝	77.362	476.26
⅞	40.448	130.19						
13	40.841	132.73	¾	58.905	276.12	¾	77.754	481.11
			⅞	59.298	279.81	⅞	78.147	485.98
⅛	41.233	135.30	19	59.690	283.53	25	78.540	490.87
¼	41.626	137.89						
⅜	42.019	140.50	⅛	60.083	287.27	⅛	78.933	495.79
			¼	60.476	291.04	¼	79.325	500.74
½	42.412	143.14	⅜	60.868	294.83	⅜	79.718	505.71
⅝	42.804	145.80						
¾	43.197	148.49	½	61.261	298.65	½	80.111	510.71
			⅝	61.654	302.49	⅝	80.503	515.72
⅞	43.590	151.20	¾	62.046	306.35	¾	80.896	520.77
14	43.982	153.94						
⅛	44.375	156.70	⅞	62.439	310.24	⅞	81.289	525.84
			20	62.832	314.16	26	81.681	530.93
¼	44.768	159.48	⅛	63.225	318.10	⅛	82.074	536.05
⅜	45.160	162.30						
½	45.553	165.13	¼	63.617	322.06	¼	82.467	541.19
			⅜	64.010	326.05	⅜	82.860	546.35
⅝	45.946	167.99	½	64.403	330.06	½	83.252	551.55
¾	46.338	170.87						
⅞	46.731	173.78	⅝	64.795	334.10	⅝	83.645	556.76
			¾	65.188	338.16	¾	84.038	562.00
15	47.124	176.71	⅞	65.581	342.25	⅞	84.430	567.27
⅛	47.517	179.67	21	65.973	346.36	27	84.823	572.56
¼	47.909	182.65	⅛	66.366	350.50	⅛	85.216	577.87
			¼	66.759	354.66	¼	85.608	583.21
⅜	48.302	185.66	⅜	67.152	358.84	⅜	86.001	588.57
½	48.695	188.69	½	67.544	363.05	½	86.394	593.96
⅝	49.087	191.75	⅝	67.937	367.28	⅝	86.786	599.37

(*Continued on following page*)

Index to Tables and Data appears on Pages 777 and 778.

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Circumferences and Areas of Circles (Continued)

Diam.	Circum.	Area	Diam.	Circum.	Area	Diam.	Circum.	Area
27 ⅝	87.179	604.81	33 ⅝	105.636	888.00	39 ⅝	124.486	1233.2
¾	87.572	610.27	¾	106.029	894.62	¾	124.878	1241.0
28	87.965	615.75	⅞	106.421	901.26	⅞	125.271	1248.8
⅛	88.357	621.26	34	106.814	097.92	40	125.664	1256.6
¼	88.750	626.80	⅛	107.207	914.61	⅛	126.056	1264.5
⅜	89.143	632.36	¼	107.600	921.32	¼	126.449	1272.4
½	89.535	637.94	⅜	107.992	928.06	⅜	126.842	1280.3
⅝	89.928	643.55	½	108.385	934.82	½	127.235	1288.2
¾	90.321	649.18	⅝	108.778	941.61	⅝	127.627	1296.2
⅞	90.713	654.84	¾	109.170	948.42	¾	128.020	1304.2
29	91.106	660.52	⅞	109.563	955.25	⅞	128.413	1312.2
⅛	91.499	666.23	35	109.956	962.11	41	128.805	1320.3
¼	91.892	671.96	⅛	110.348	969.00	⅛	129.198	1328.3
⅜	92.284	677.71	¼	110.741	975.91	¼	129.591	1336.4
½	92.677	683.49	⅜	111.134	982.84	⅜	129.983	1344.5
⅝	93.070	689.30	½	111.527	989.80	½	130.376	1352.7
¾	93.462	695.13	⅝	111.919	996.78	⅝	130.769	1360.8
⅞	93.855	700.98	¾	112.312	1003.8	¾	131.161	1369.0
30	94.248	706.86	⅞	112.705	1010.8	⅞	131.554	1377.2
⅛	94.640	712.76	36	113.097	1017.9	42	131.947	1385.4
¼	95.033	718.69	⅛	113.490	1025.0	⅛	132.340	1393.7
⅜	95.426	724.64	¼	113.883	1032.1	¼	132.732	1402.0
½	95.819	730.62	⅜	114.275	1039.2	⅜	133.125	1410.3
⅝	96.211	736.62	½	114.668	1046.3	½	133.518	1418.6
⅝	96.604	742.64	⅝	115.061	1053.5	⅝	133.910	1427.0
¾	96.997	748.69	¾	115.454	1060.7	¾	134.303	1435.4
31	97.389	754.77	⅞	115.846	1068.0	⅞	134.696	1443.8
⅛	97.782	760.87	37	116.239	1075.2	43	135.088	1452.2
¼	98.175	766.99	⅛	116.632	1082.5	⅛	135.481	1460.7
⅜	98.567	773.14	¼	117.024	1089.8	¼	135.874	1469.1
½	98.960	779.31	⅜	117.417	1097.1	⅜	136.267	1477.6
⅝	99.353	785.51	½	117.810	1104.5	½	136.659	1486.2
¾	99.746	791.73	⅝	118.202	1111.8	⅝	137.052	1494.7
⅞	100.138	797.98	¾	118.596	1119.2	¾	137.445	1503.3
32	100.531	804.25	⅞	118.988	1126.7	⅞	137.837	1511.9
⅛	100.924	810.54	38	119.381	1134.1	44	138.230	1520.5
¼	101.316	816.86	⅛	119.773	1141.6	⅛	138.623	1529.2
⅜	101.709	823.21	¼	120.166	1149.1	¼	139.015	1537.9
½	102.102	829.58	⅜	120.559	1156.6	⅜	139.408	1546.6
⅝	102.494	835.97	½	120.951	1164.2	½	139.801	1555.3
¾	102.887	842.39	⅝	121.344	1171.7	⅝	140.194	1564.0
⅞	103.280	848.83	¾	121.737	1179.3	¾	140.586	1572.8
33	103.673	855.30	⅞	122.129	1186.9	⅞	140.979	1581.6
⅛	104.065	861.79	39	122.522	1194.6	45	141.372	1590.4
¼	104.458	868.31	⅛	122.915	1202.3	⅛	141.764	1599.3
⅜	104.851	874.85	¼	123.308	1210.0	¼	142.157	1608.2
½	105.243	881.41	⅜	123.700	1217.7	⅜	142.550	1617.0
			½	124.093	1225.4	½	142.942	1626.0
						⅝	143.335	1634.9

(*Continued on following page*)

Index to Tables and Data appears on Pages 777 and 778.

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Circumferences and Areas of Circles (Continued)

Diam.	Circum.	Area	Diam.	Circum.	Area	Diam.	Circum.	Area
45 ⅝	143.728	1643.9	51 ⅝	162.185	2093.2	57 ⅝	180.249	2585.4
¾	144.121	1652.9	¾	162.577	2103.3	½	180.642	2596.7
46	144.513	1661.9	⅞	162.970	2113.5	⅝	181.034	2608.0
⅛	144.906	1670.9	52	163.363	2123.7	¾	181.427	2619.4
¼	145.299	1680.0	⅛	163.756	2133.9	⅞	181.820	2630.7
⅜	145.691	1689.1	¼	164.148	2144.2	58	182.212	2642.1
½	146.084	1698.2	⅜	164.541	2154.5	⅛	182.605	2653.5
⅝	146.477	1707.4	½	164.934	2164.8	¼	182.998	2664.9
¾	146.869	1716.5	⅝	165.326	2175.1	⅜	183.390	2676.4
⅞	147.262	1725.7	¾	165.719	2185.4	½	183.783	2687.8
47	147.655	1734.9	⅞	166.112	2195.8	⅝	184.176	2699.3
⅛	148.048	1744.2	53	166.504	2206.2	¾	184.569	2710.9
¼	148.440	1753.5	⅛	166.897	2216.6	⅞	184.961	2722.4
⅜	148.833	1762.7	¼	167.290	2227.0	59	185.354	2734.0
½	149.226	1772.1	⅜	167.683	2237.5	⅛	185.747	2745.6
⅝	149.618	1781.4	½	168.075	2248.0	¼	186.139	2757.2
¾	150.011	1790.8	⅝	168.468	2258.5	⅜	186.532	2768.8
⅞	150.404	1800.1	¾	168.861	2269.1	½	186.925	2780.5
48	150.796	1809.6	⅞	169.253	2279.6	⅝	187.317	2792.2
⅛	151.189	1819.0	54	169.646	2290.2	¾	187.710	2803.9
¼	151.582	1828.5	⅛	170.039	2300.8	⅞	188.103	2815.7
⅜	151.975	1837.9	¼	170.431	2311.5	60	188.496	2827.4
½	152.367	1847.5	⅜	170.824	2322.1	⅛	188.888	2839.2
⅝	152.760	1857.0	½	171.217	2332.8	¼	189.281	2851.0
¾	153.153	1866.5	⅝	171.609	2343.5	⅜	189.674	2862.9
⅞	153.545	1876.1	¾	172.002	2354.3	½	190.066	2874.8
49	153.938	1885.7	⅞	172.395	2365.0	⅝	190.459	2886.6
⅛	154.331	1895.4	55	172.788	2375.8	¾	190.852	2898.6
¼	154.723	1905.0	⅛	173.180	2386.6	⅞	191.244	2910.5
⅜	155.116	1914.7	¼	173.573	2397.5	61	191.637	2922.5
½	155.509	1924.4	⅜	173.966	2408.3	⅛	192.030	2934.5
⅝	155.902	1934.2	½	174.358	2419.2	¼	192.423	2946.5
¾	156.294	1943.9	⅝	174.751	2430.1	⅜	192.815	2958.5
⅞	156.687	1953.7	¾	175.144	2441.1	½	193.208	2970.6
50	157.080	1963.5	⅞	175.536	2452.0	⅝	193.601	2982.7
⅛	157.472	1973.3	56	175.929	2463.0	¾	193.993	2994.8
¼	157.865	1983.2	⅛	176.322	2474.0	⅞	194.386	3006.9
⅜	158.258	1993.1	¼	176.715	2485.0	62	194.779	3019.1
½	158.650	2003.0	⅜	177.107	2496.1	⅛	195.171	3031.3
⅝	159.043	2012.9	½	177.500	2507.2	¼	195.564	3043.5
¾	159.426	2022.8	⅝	177.893	2518.3	⅜	195.957	3055.7
⅞	159.829	2032.8	¾	178.285	2529.4	½	196.350	3068.0
51	160.221	2042.8				⅝	196.742	3080.3
⅛	160.614	2052.8	⅞	178.678	2540.6	¾	197.135	3092.6
¼	161.007	2062.9	57	179.071	2551.8			
⅜	161.399	2073.0	⅛	179.463	2563.0	⅞	197.528	3104.9
½	161.792	2083.1	¼	179.856	2574.2	63	197.920	3117.2

For diameters not listed in the tables, figure from the following:
Circumference $= 2r\pi = 2r \times 3.1416 =$ diameter $\times 3.1416$.
Area $= r^2\pi = r^2 \times 3.1416$.
It is usually simplest to figure area ($r^2\pi$) from circumference ($2r\pi$) by multiplying the latter by $r/2$.

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Areas of Small Circles

Figured from diameters in decimal fractions of 1 inch (or other unit of linear measurement).

Diameter	SECOND DECIMAL IN LENGTH OF DIAMETER									
	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
.0	.0	.000078	.00031	.0007	.00125	.00196	.00283	.00385	.00503	.00636
.1	.0078	.0095	.0113	.0133	.0154	.0177	.0201	.0227	.0255	.0283
.2	.0314	.03464	.038	.0415	.0452	.0491	.0531	.0572	.0616	.066
.3	.0706	.0755	.0804	.0855	.0908	.0962	.1018	.1075	.1134	.1195
.4	.1256	.132	.1385	.1452	.1520	.1590	.1662	.1735	.181	.1886
.5	.1963	.2043	.2124	.2206	.2290	.2376	.2463	.2552	.2642	.2734
.6	.2827	.2922	.3014	.3117	.3217	.3318	.3421	.3526	.3632	.3739
.7	.3848	.3959	.4071	.4185	.4301	.4418	.4536	.4657	.4778	.4902
.8	.5026	.5153	.5281	.5411	.5542	.5674	.5809	.5945	.6082	.6221
.9	.6362	.6504	.6648	.6793	.694	.7088	.7238	.739	.7543	.7698

Example: What is area of circle with diameter 0.45 inch (or centimeter). . Follow line .4 column .05. Answer: .1590 square inch (or square centimeter).

Decimal Equivalents of Sixty-Fourths

To convert common fraction into decimal fraction, give the numerator decimal form by ding a period and ciphers. Then divide by denominator.

1/64 = .0156	17/64 = .2656	33/64 = .5156	49/64 = .7656
1/32 = .0312	9/32 = .2812	17/32 = .5312	25/32 = .7812
3/64 = .0468	19/64 = .2968	35/64 = .5468	51/64 = .7968
1/16 = .0625	5/16 = .3125	9/16 = .5625	13/16 = .8125
5/64 = .0781	21/64 = .3281	37/64 = .5781	53/64 = .8281
3/32 = .0937	11/32 = .3437	19/32 = .5937	27/32 = .8437
7/64 = .1093	23/64 = .3593	39/64 = .6093	55/64 = .8593
1/8 = .1250	3/8 = .3750	5/8 = .6250	7/8 = .8750
9/64 = .1406	25/64 = .3906	41/64 = .6406	57/64 = .8906
5/32 = .1562	13/32 = .4062	21/32 = .6562	29/32 = .9062
11/64 = .1718	27/64 = .4218	43/64 = .6718	59/64 = .9218
3/16 = .1875	7/16 = .4375	11/16 = .6875	15/16 = .9375
13/64 = .2031	29/64 = .4531	45/64 = .7031	61/64 = .9531
7/32 = .2187	15/32 = .4687	23/32 = .7187	31/32 = .9687
15/64 = .2343	31/64 = .4843	47/64 = .7343	63/64 = .9843
1/4 = .2500	1/2 = .5000	3/4 = .7500	1 = 1.0000

Index to Tables and Data appears on Pages 777 and 778.

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Decimal Fractions of a Linear Inch in Millimetres

Inch	Millimetres	Inch	Millimetres	Inch	Millimetres	Inches	Millimetres
.01	.254	.29	7.366	.57	14.478	.85	21.590
.02	.508	.30	7.620	.58	14.732	.86	21.844
.03	.762	.31	7.874	.59	14.986	.87	22.098
.04	1.016	.32	8.128	.60	15.240	.88	22.352
.05	1.270	.33	8.382	.61	15.494	.89	22.606
.06	1.524	.34	8.636	.62	15.748	.90	22.860
.07	1.778	.35	8.890	.63	16.002	.91	23.114
.08	2.032	.36	9.114	.64	16.256	.92	23.368
.09	2.286	.37	9.398	.65	16.510	.93	23.622
.10	2.540	.38	9.652	.66	16.764	.94	23.876
.11	2.794	.39	9.906	.67	17.018	.95	24.130
.12	3.048	.40	10.160	.68	17.272	.96	24.384
.13	3.302	.41	10.414	.69	17.526	.97	24.638
.14	3.556	.42	10.668	.70	17.780	.98	24.892
.15	3.810	.43	10.922	.71	18.034	.99	25.146
.16	4.064	.44	11.176	.72	18.288	1.00	25.400
.17	4.318	.45	11.430	.73	18.542	2.00	50.799
.18	4.572	.46	11.684	.74	18.796	3.00	76.199
.19	4.826	.47	11.938	.75	19.050	4.00	101.598
.20	5.080	.48	12.192	.76	19.304	5.00	126.998
.21	5.334	.49	12.446	.77	19.558	6.00	152.397
.22	5.588	.50	12.700	.78	19.812	7.00	177.797
.23	5.842	.51	12.945	.79	20.066	8.00	203.196
.24	6.096	.52	13.208	.80	20.320	9.00	228.596
.25	6.350	.53	13.462	.81	20.574	10.00	253.995
.26	6.604	.54	13.716	.82	20.828	11.00	279.395
.27	6.858	.55	13.970	.83	21.082	12.00	304.794
.28	7.112	.56	14.224	.84	21.336	1 foot	

Boiling Point of Water at Various Altitudes

Altitude Above Sea Level in Feet	Boiling Point of Water in Degrees Fahrenheit
0.000	212
1,025	210
2,063	208
3,115	206
4,169	204
5,225	202
6,304	200
7,381	198
8,431	196
9,579	194
10,685	192
11,800	190

To keep the cooling water from reaching the boiling point at any altitude, as well as at any atmospheric temperature, automatic heat regulation is therefore necessary.

Index to Tables and Data appears on Pages 777 and 778.

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United States Official Millimeters Conversion Table

Millimeters	Equivalent in Inches	Millimeters	Equivalent in Inches
1	0.03937	51	2.00787
2	0.07874	52	2.04724
3	0.11811	53	2.08661
4	0.15748	54	2.12598
5	0.19685	55	2.16535
6	0.23622	56	2.20472
7	0.27559	57	2.24409
8	0.31496	58	2.28346
9	0.35433	59	2.32283
10	0.39370	60	2.36220
11	0.43307	61	2.40157
12	0.47244	62	2.44094
13	0.51181	63	2.48031
14	0.55118	64	2.51968
15	0.59055	65	2.55905
16	0.62992	66	2.59842
17	0.66929	67	2.63779
18	0.70866	68	2.67716
19	0.74803	69	2.71653
20	0.78740	70	2.75590
21	0.82677	71	2.79527
22	0.86614	72	2.83464
23	0.90551	73	2.87401
24	0.94488	74	2.91338
25	0.98425	75	2.95275
26	1.02362	76	2.99212
27	1.06299	77	3.03149
28	1.10236	78	3.07086
29	1.14173	79	3.11023
30	1.18110	80	3.14960
31	1.22047	81	3.18897
32	1.25984	82	3.22834
33	1.29921	83	3.26771
34	1.33858	84	3.30708
35	1.37795	85	3.34645
36	1.41732	86	3.38582
37	1.45669	87	3.42519
38	1.49606	88	3.46456
39	1.53543	89	3.50393
40	1.57480	90	3.54330
41	1.61417	91	3.58267
42	1.65354	92	3.62204
43	1.69291	93	3.66141
44	1.73228	94	3.70078
45	1.77165	95	3.74015
46	1.81102	96	3.77952
47	1.85039	97	3.81889
48	1.88976	98	3.85826
49	1.92913	99	3.89763
50	1.96850	100	3.93700

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Kilograms per Square Centimeter in Pounds per Square Inch and Vice Versa

To convert kilograms per square centimeter into pounds per square inch, multiply by 14.223. Oppositely, divide pounds per square inch by 14.223 to convert into kilograms per square centimeter.

Lbs. per Square Inch	Kilograms per Square Centimeter	Lbs. per Square Inch	Kilograms per Square Centimeter	Lbs. per Square Inch	Kilograms per Square Centimeter	Lbs. per Square Inch	Kilograms per Square Centimeter
1	.0703	41	2.8826	81	5.6949	205	14.4129
2	.1406	42	2.9529	82	5.7652	210	14.7645
3	.2109	43	3.0232	83	5.8355	215	15.1160
4	.2812	44	3.0935	84	5.9058	220	15.4675
5	.3515	45	3.1638	85	5.9761	225	15.8191
6	.4218	46	3.2341	86	6.0464	230	16.1706
7	.4921	47	3.3044	87	6.1167	235	16.5221
8	.5624	48	3.3747	88	6.1870	240	16.8737
9	.6328	49	3.4450	89	6.2573	245	17.2252
10	.7031	50	3.5153	90	6.3276	250	17.5767
11	.7734	51	3.5856	91	6.3979	255	17.9283
12	.8437	52	3.6559	92	6.4682	260	18.2798
13	.9140	53	3.7263	93	6.5385	265	18.6313
14	.9843	54	3.7966	94	6.6088	270	18.9829
15	1.0546	55	3.8669	95	6.6722	275	19.3344
16	1.1249	56	3.9372	96	6.7495	280	19.6860
17	1.1952	57	4.0075	97	6.8198	285	20.0375
18	1.2655	58	4.0778	98	6.8901	290	20.3890
19	1.3358	59	4.1481	99	6.9604	295	20.7406
20	1.4062	60	4.2184	100	7.0307	300	21.0921
21	1.4764	61	4.2887	105	7.3822	310	21.7951
22	1.5467	62	4.3590	110	7.7338	320	22.4981
23	1.6171	63	4.4293	115	8.0853	330	23.2012
24	1.6874	64	4.4996	120	8.4368	340	23.9043
25	1.7577	65	4.5699	125	8.7884	350	24.6073
26	1.8280	66	4.6402	130	9.1399	360	25.3104
27	1.8983	67	4.7106	135	9.4914	370	26.0135
28	1.9686	68	4.7809	140	9.8430	380	26.7166
29	2.0389	69	4.8512	145	10.1945	390	27.4196
30	2.1092	70	4.9215	150	10.5460	400	28.1227
31	2.1795	71	4.9918	155	10.8976	410	28.8258
32	2.2498	72	5.0621	160	11.2491	420	29.5288
33	2.3201	73	5.1324	165	11.6006	430	30.2319
34	2.3905	74	5.2027	170	11.9522	440	30.9350
35	2.4607	75	5.2730	175	12.3037	450	31.6380
36	2.5310	76	5.3433	180	12.6553	460	32.3411
37	2.6013	77	5.4136	185	13.0068	470	33.0442
38	2.6717	78	5.4939	190	13.3583	480	33.7437
39	2.7420	79	5.5542	195	13.7099	490	34.4503
40	2.8123	80	5.6246	200	14.0614	500	35.1533

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A Convenient Metric Conversion

Compiled by W. C. Hunt

Millimeters × .03937 = inches.
Millimeters ÷ 25.4 = inches.
Centimeters × .3937 = inches.
Centimeters ÷ 2.54 = inches.
Meters × 39.37 = inches. (Act of Congress.)
Meters × 3.281 = feet.
Meters × 1.094 = yards.
Kilometers × .6214 = miles.
Kilometers ÷ 1.6093 = miles.
Kilometers × 3280.8 = feet.
Square Millimeters × .00155 = square inches.
Square Millimeters ÷ 645.2 = square inches.
Square Centimeters × .155 = square inches.
Square Centimeters ÷ 6.452 = square inches.
Square Meters × 10.764 = square feet.
Square Kilometers × 247.1 = acres.
Hectare × 2.471 = acres.
Cubic Centimeters ÷ 16.387 = cubic inches.
Cubic Centimeters ÷ 3.697 = fl. drachms.
Cubic Centimeters ÷ 29.57 = fluid oz.
Cubic Meters × 35.314 = cubic feet.
Cubic Meters × 1.308 = cubic yards.
Cubic Meters × 264.2 = gallons (231 cubic inches).
Liters × 61.023 = cubic inches. (Act of Congress.)
Liters × 33.84 = fluid ounces.
Liters × .2642 = gallons (231 cubic inches).
Liters ÷ 3.785 = gallons (31 cubic inches).
Liters ÷ 28.317 = cubic feet.
Hectoliters × 3.531 = cubic feet.
Hectoliters × 2.838 = bushels (2150.42 cubic inches)
Hectoliters × .1308 = cubic yards.
Hectoliters × 26.42 = gallons (231 cubic inches).
Grammes × 15.432 = grains. (Act of Congress.)
Grammes × 981 = dynes.
Grammes ÷ 28.35 = ounces avoirdupois.
Joule × .7373 = foot pounds.
Kilograms × 2.2046 = pounds.
Kilograms × 35.27 = ounces avoirdupois.
Kilograms ÷ 907.2 = tons (2,000 pounds).
Kilograms per square cent. × 14.223 = pounds per square inch.
Kilogrammeters × 7.233 = foot lbs.
Kilo per Meter × .672 = lbs. per foot.
Kilo. per Cu. Meter × .0624 = lbs. per cubic foot.
Kilo-watts × 1.34 = horse-power.
Watts ÷ 746 = horse-power.
Watts × .7373 = ft. pounds per second.
Caloric × 3.968 = B.T.U.
Cheval vapeur × .9863 = horse-power.
(Centigrade × 1.8) + 32 = degree Fahrenheit.
Francs × .193 = dollars.
Gravity Paris = 980.94 Centimeter per sec.

French and American Equivalent Measures

MEASURES OF LENGTH

French		United States	
1	meter	39.37	inches, or 3.28083 feet
.3048	meter	1	foot
1	centimeter	.3937	inch
2.54	centimeters	1	inch
1	millimeter	.03937	inch, or 1/25 inch nearly
25.4	millimeters	1	inch
1	kilometer	1093.61	yards, or .62137 mile

(*Continued on following page*)

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Measures of Weight

1	gramme	15.432	grains
.0648	gramme	1	grain
28.35	grammes	1	ounce avoirdupois
1	kilogramme	2.2046	pounds
.4536	kilogramme	1	pound
1	tonne or metric ton	.9842	ton of 2,240 pounds
		19.68	cwt.
1000	kilogrammes	2204.6	pounds

Measures of Capacity

Liter (1 cubic decimeter)	61.023	cubic inches
	.03531	cubic foot
	.2642	gallon (American).
	2.202	pounds water at 62° F.
8.317 liters	1	cubic foot
3.543 liters	1	gallon (British).
4.785 liters	1	gallon (American).

Table of Kilogramme Calories, Equivalent to British Thermal Units

British Thermal	0	1	2	3	4	5	6	7	8	9	British Thermal
0	..	.252	.504	.756	1.008	1.260	1.512	1.764	2.016	2.268	0
10	2.52	2.772	3.024	3.276	3.528	3.780	4.032	4.284	4.536	4.788	10
20	5.04	5.292	5.544	5.796	6.048	6.300	6.552	6.804	7.056	7.308	20
30	7.56	7.812	8.064	8.316	8.568	8.820	9.072	9.324	9.576	9.828	30
40	10.08	10.332	10.584	10.836	11.088	11.340	11.592	11.844	12.096	12.348	40
50	12.60	12.852	13.104	13.356	13.608	13.860	14.112	14.364	14.616	14.868	50
60	15.12	15.372	15.624	15.876	16.128	16.380	16.632	16.884	17.136	17.388	60
70	17.64	17.892	18.144	18.396	18.648	18.900	19.152	19.404	19.656	19.908	70
80	20.16	20.412	20.664	20.916	21.168	1.420	21.672	21.924	22.176	22.428	80
90	22.68	22.932	23.184	23.436	23.688	23.940	24.192	24.444	24.696	24.948	90

1 British thermal unit = 251.996 gramme calories.

"Roadability" on Direct Gear

By "roadability" there is loosely understood a certain facility of car performance, with special reference to the avoidance of gear changes. For measuring or estimating the "roadability" of one car in comparison with that of another, on the supposition of equal fitness of the engines and the mechanical efficiency of the cars, the following formula has been devised:

$$A = \frac{B^2SNR}{WD}$$

in which A is "roadability" on direct gear, B bore of engine, S stroke, N number of cylinders R final gear ratio, D diameter of wheels and W total weight moved.

The formula is not applicable to vehicles, such as delivery wagons and trucks, in the operation of which the use of the lower gears is the normal condition.

"Roadability" and hill-climbing ability are practically identical, excepting that maximum speed and results from the lower gears are considered in hill-climbing.

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Thermometer Scales

Fahrenheit	Centigrade	Reaumur	Fahrenheit	Centigrade	Reaumur
95	35	28	230	110	88
90	32.2				
86	30	24	221	105	84
80	26.6				
77	25	20	212	100	80 Boiling Point
70	21.1				
68	20	16	203	95	76
60	15.5				
59	15	12	194	90	72
50	10	8	185	85	68
40	4.4				
41	5	4	176	80	64
32	0	0 Freezing Point	167	75	60
30	-1.1				
23	-5	-4	158	70	56
20	-6.7				
14	-10	-8	149	65	52
10	-12.2				
5	-15	-12	140	60	48
Zero 0	-17.78	-14.22			
-4	-20	-16	131	55	44
-10	-23.3				
-13	-25	-20	122	50	40
-20	-28.9				
-22	-30	-24	113	45	36
-30	-34.4				
-31	-35	-28	104	40	32
-40	-40	-32	95	35	28

METAL WORKING and HEAT-TREATMENT TEMPERATURES in FAHR and CENTIG. SCALES

Fahrenheit	Centigrade	
2100	1148.9	
2000	1095.3	1100
1900	1037.8	
		1000
1800	982.2	
1700	926.7	
		900
1600	871.1	
1500	815.5	800
1400	760	
1300	704.0	700
1200	648.9	
1100	593.3	600
1000	537.8	
900	482.2	500
800	426.7	
		400
700	371.1	
600	315.5	300
500	260	
400	204.4	200
300	148.9	
230		110

Fahrenheit:- $F = \frac{9}{5}C + 32$; also: $F = \frac{9}{4}R + 32$
Centigrade:- $C = \frac{5}{9}(F - 32)$ or $\frac{5}{9}F - 17.78$; also: $C = \frac{5}{4}R$
Réaumur:- $R = \frac{4}{9}(F - 32)$ or $\frac{4}{9}F - 14.22$; also: $R = \frac{4}{5}C$

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Thermometer Scales—Continued

In order to convert degrees Fahrenheit (F.) into degrees Centigrade (C.), subtract 32, multiply the remainder by 5 and divide by 9. To turn Centigrade into Fahrenheit, multiply the number of deg. C. by 9, divide by 5 and add 32.

The Réaunner scale is still largely used in France. Five degrees C. equal 4 degrees R.

These relations are expressed in the formulas at the foot of the appended scales. They also indicate another mode of converting F. into C.; namely, multiply F. by ⅝ and deduct 17.78, the latter figure representing 32 × ⅝ or the number of degrees C. that the F. zero is lower than the C. zero. This mode of figuring has the advantage that it is not necessary to remember, or reason out, whether 32 is to be subtracted first or last. In converting from one scale to another, numerical values are taken as negative below the zero of each scale.

Baume Hydrometer and Specific Gravity Equivalents

For liquids heavier than water (such as electrolytes of storage batteries, electro-plating baths etc.), at 60° F.

$$\text{Specific gravity} = \frac{145}{145 - {}^{\circ}\text{Bé}} \quad \text{and Baumé} = 145 - \frac{145}{\text{Sp. Gr.}}$$

Baumé	Specific Gravity	Baumé	Specific Gravity	Baumé	Specific Gravity	Baumé	Specific Gravity	Baumé	Specific Gravity
0	1.000	10	1.074	20	1.160	30	1.260	40	1.381
1	1.006	11	1.082	21	1.169	31	1.271	45	1.450
2	1.014	12	1.090	22	1.178	32	1.283	50	1.526
3	1.021	13	1.098	23	1.188	33	1.294	55	1.611
4	1.028	14	1.106	24	1.198	34	1.306	60	1.705
5	1.035	15	1.115	25	1.208	35	1.318	65	1.812
6	1.043	16	1.124	26	1.218	36	1.330	70	1.933
7	1.050	17	1.132	27	1.228	37	1.342	....	....
8	1.058	18	1.141	28	1.239	38	1.355	....	....
9	1.066	19	1.150	29	1.250	39	1.367	....	....

For liquids lighter than water (gasoline and other engine fuels), the Baumé scale is based on the formula:

$$\text{Specific gravity (at 60° F.)} = \frac{140}{130 + \text{Bé}} \quad \text{or Baumé} = \frac{140}{\text{Sp. Gr.}} - 130$$

The scale is as follows

Baumé	Specific Gravity	Lbs. in Gal.	Baumé	Specific Gravity	Lbs. in Gal.	Baumé	Specific Gravity	Lbs. in Gal.	Baumé	Specific Gravity	Lbs. in Gal.
10	1.0000	8.33	31	0.8695	7.25	52	0.7692	6.42	73	0.6896	5.77
11	0.9929	8.27	32	0.8641	7.21	53	0.7650	6.39	74	0.6863	5.74
12	0.9859	8.21	33	0.8588	7.16	54	0.7608	6.36	75	0.6829	5.71
13	0.9790	8.16	34	0.8536	7.12	55	0.7567	6.32	76	0.6796	5.68
14	0.9722	8.10	35	0.8484	7.07	56	0.7526	6.29	77	0.6763	5.65
15	0.9655	8.05	36	0.8433	7.03	57	0.7486	6.26	78	0.6730	5.63
16	0.9589	7.99	37	0.8383	6.99	58	0.7446	6.22	79	0.6698	5.60
17	0.9523	7.94	38	0.8333	6.95	59	0.7407	6.19	80	0.6666	5.57
18	0.9459	7.88	39	0.8284	6.91	60	0.7368	6.16	81	0.6635	5.55
19	0.9395	7.83	40	0.8235	6.87	61	0.7329	6.13	82	0.6604	5.51
20	0.9333	7.78	41	0.8187	6.83	62	0.7290	6.10	83	0.6573	5.48
21	0.9271	7.73	42	0.8139	6.80	63	0.7253	6.07	84	0.6542	5.45
22	0.9210	7.68	43	0.8092	6.76	64	0.7216	6.03	85	0.6511	5.42
23	0.9150	7.63	44	0.8045	6.72	65	0.7179	6.00	86	0.6481	5.40
24	0.9090	7.58	45	0.8000	6.68	66	0.7142	5.97	87	0.6451	5.38
25	0.9032	7.54	46	0.7954	6.64	67	0.7106	5.94	88	0.6422	5.36
26	0.8974	7.49	47	0.7909	6.60	68	0.7070	5.91	89	0.6392	5.33
27	0.8917	7.44	48	0.7865	6.57	69	0.7035	5.88	90	0.6363	5.30
28	0.8860	7.39	49	0.7821	6.53	70	0.7000	5.85	....	.....	....
29	0.8805	7.34	50	0.7777	6.49	71	0.6965	5.82	....	.....	....
30	0.8750	7.29	51	0.7734	6.46	72	0.6930	5.79	....	.....	....

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Anti-Freezing Mixtures

The percentage of alcohol, by volume, to give a certain freezing point can be obtained from the table below:

Freezing Point, Degrees Fahrenheit	DENATURED		WOOD	
	Alcohol, per Cent.	Water, per Cent.	Alcohol, per Cent.	Water, per Cent.
+10	28	72	17	83
0	40	60	24	76
−10	52	48	31	69
−20	63	37	38	62

So little water is lost by evaporation that it is only necessary to add alcohol to the system from time to time, to replace that which is used up.

The proportions of glycerine and water may be obtained from the table:

Freezing Point	Glycerine	Water
+28 degrees Fahrenheit	10 per cent.	90 per cent.
+15 degrees Fahrenheit	30 per cent.	70 per cent.
+ 5 degrees Fahrenheit	40 per cent.	50 per cent.
0 degrees Fahrenheit	48 per cent.	52 per cent.
− 5 degrees Fahrenheit	54 per cent.	46 per cent.
−10 degrees Fahrenheit	58 per cent.	42 per cent.

The difficulties in the way of using glycerine and water alone have led to the use of a mixture containing alcohol in addition. The alcohol and glycerine are generally added in equal parts to the water, the amount depending upon the freezing point desired. The percentage of mixture to add may be obtained from the accompanying table:

Freezing Point	Mixture Glycerine and Alcohol	Water
+20 degrees Fahrenheit	15 per cent.	85 per cent.
+15 degrees Fahrenheit	20 per cent.	80 per cent.
+10 degrees Fahrenheit	24 per cent.	76 per cent.
+ 5 degrees Fahrenheit	27 per cent.	73 per cent.
0 degrees Fahrenheit	29 per cent.	71 per cent.
− 5 degrees Fahrenheit	30 per cent.	70 per cent.
−15 degrees Fahrenheit	32 per cent.	68 per cent.

Calcium chloride in water is another solution that has been used with success. When purchasing calcium chloride it is very important to ask for the chemically pure salt as the commercial variety contains free acid which reacts on the metal parts of the cooling system. If it is impossible to obtain the former, the latter may be made fit for use by neutralizing the acid. To do this add ammonia or soda ash gradually to the calcium chloride solution until blue litmus paper no longer turns pink when moistened with the solution. The amount of calcium chloride to use may be found from the table:

Pounds of Calcium Chloride per Gallon	Freezing Point,
2	+18.0 Degrees Fahrenheit
3	+ 1.5 " "
4	−17.0 " "
5	−39.0 " "

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Measurement of Grades

The base of the triangle represents a line 100 feet long and the sloping lines different road grades. The first grade has a rise of 5 feet and is designat d as a 5 per cent grade or a 1 in 20 grade. The distance from which the percentage is figured is not that actually traveled by a car in ascending such a slope but is the length of the base line of the slope. This system of measur ng a grade (by the tangent of the angle of inclination and not by its sine) has come from the surveyor's practice of measuring grades on maps that show base lines and altitudes but not the actual length or angle of an incline.

A grade of 100 percent, under this accepted system, corresponds to an angle of 45 degrees, and not to 90 degrees as commonly supposed.

At the upper end of the second sloping line the elevation amounts to 6⅔ feet from a 100-foot base, and the grade is a 6⅔ per cent or 1 in 15 grade. Similarly, a 1 in 3 grade is the same as a 33⅓ per cent grade, a 1 in 2 grade the same as a 50 per cent grade.

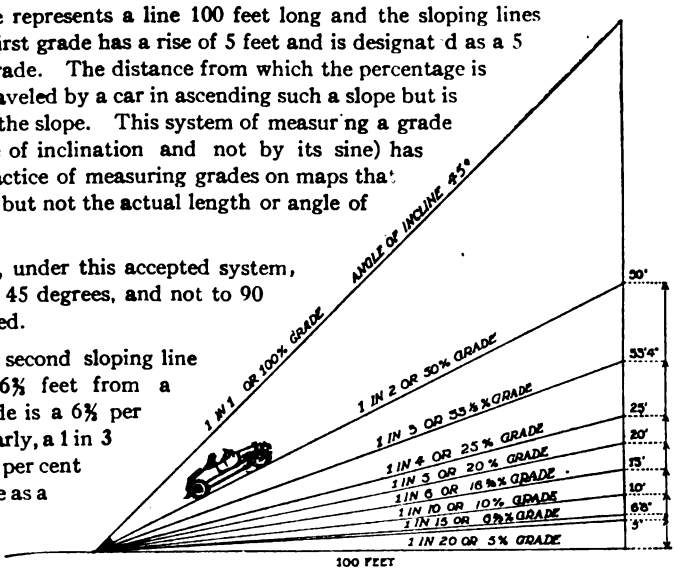

Table of Gradients

Slope	Percent Grade	Equal to Angle of	Rise or Fall in One Mile, Feet
1 in 5	20	11° 19′	1056
1 " 6	17	9° 26′	880
1 " 7	14	8° 09′	754
1 " 8	12.5	7° 08′	635
1 " 9	11	6° 17′	586
1 " 10	10	5° 43′	528
1 " 11	9	5° 11′	480
1 " 12	8	4° 46′	440
1 " 13	7.75	4° 24′	406
1 " 14	7	4° 05′	337
1 " 15	6.5	3° 49′	352
1 " 16	6.25	3° 35′	330
1 " 17	6	3° 22′	310
1 " 18	5.5	3° 11′	293
1 " 19	5	3° 00′	277
1 " 20	5	2° 52′	204
1 " 25	4	2° 18′	218
1 " 30	3.3	1° 55′	155
1 " 35	2.8	1° 38′	151
1 " 40	2.5	1° 26′	132

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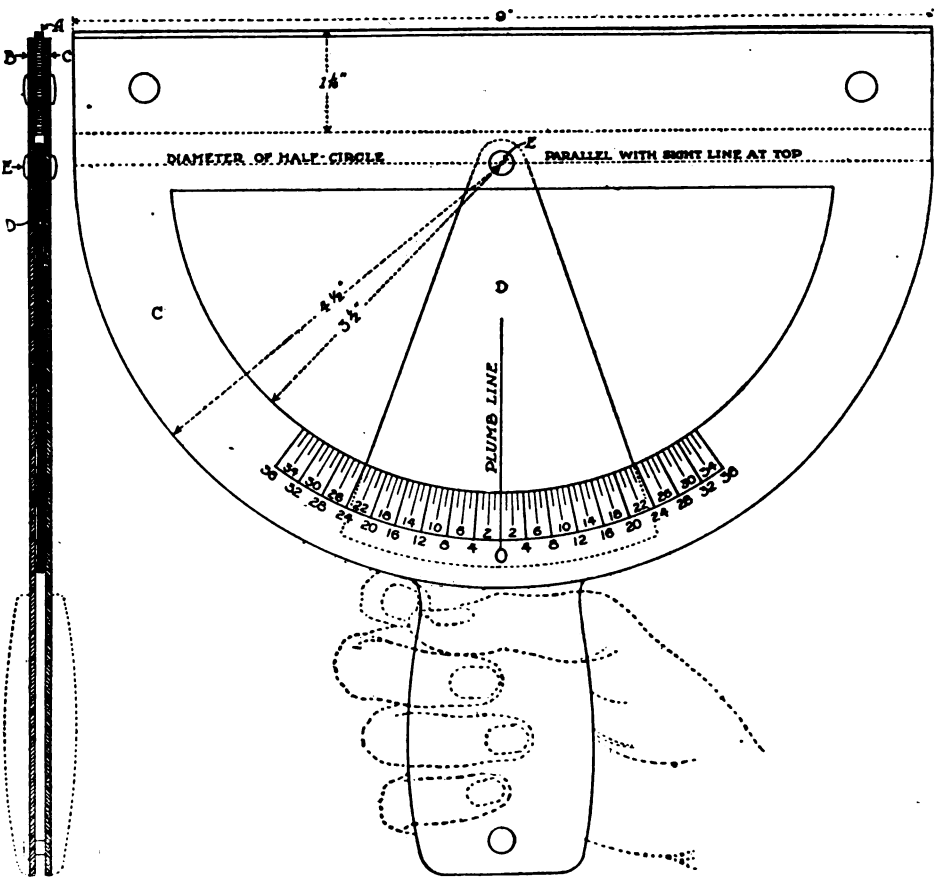
Measuring Grades from a Car

Neither the rise nor the length of the base line of a hill can be ascertained without careful surveying, and in automobile practice (such as in reporting road conditions) it is therefore necessary to find the grade by first measuring the angle of inclination, and then looking up the grade corresponding to this angle in a table compiled for this purpose.

A simple instrument for measuring the angle can be made on the plan shown in the illustration, as proposed by M. C. Krarup. Two pieces, *B* and *C*, of the shape shown are cut out of sheet brass about $\frac{1}{16}$ inch thick. A segment is cut out of *C* in order to render visible the triangular pendulum *D* suspended on a pin *E* between the two pieces. The pendulum can be cut from the same material as *B* and *C* and is marked with a line that is perfectly perpendicular when the pendulum hangs freely. A dial is marked along the open arc on *C*. With the dimensions indicated, this dial can show degrees, and fractions of degrees can be estimated. *B* and *C* are spaced apart by a straight-rule *A* about 1" broad projecting $\frac{1}{16}$ inch above their upper edges, its own upper edge affording a sighting line. *A* is of slightly thicker material than the pendulum, so that the latter has room to swing freely. The handle-pieces are not more than 3 inches long and 1⅛ inch broad, and a pin at their lower end spaces them apart when they are held loosely in the hand. Wood facings secured to these handle-pieces improve the device. On the back of *B* is pasted the Table of Grades and Corresponding Angles of Inclines on the following page.



In operating, one sights over the edge of *A*, bringing it in line with the top of the hill. *D* swings around an angle equal to the angle of inclination, and the mark on *D* points out this angle on the dial. In this position *D* is held by squeezing the handle a little, and the angle can be read with a turn of the hand. The grade corresponding to this angle can be read from the table pasted on the other side of the device with another turn of the hand.

As the instrument held in the hand is about five feet above the ground at the foot of the hill, the angle, as read, is a little too small. To correct this, one sights again from the top of the hill to the foot, which gives an angle a little too large. The mean of the two angles is the correct one. Also, one reading checks the other.

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Table of Grades and Corresponding Angles of Inclines.

(Grade Percent Equals Numerical Value of Tangents of Angle with Radius 100)

Angle, Degrees	Grade, Percent	Angle, Degrees	Grade, Percent	Angle, Degrees	Grade, Percent
½	0.87	12½	22.17	24½	45.57
1	1.74	13	23.09	25	46.63
1½	2.62	13½	24.01	25½	47.70
2	3.49	14	24.93	26	48.77
2½	4.37	14½	25.86	26½	49.86
3	5.24	15	26.80	27	50.95
3½	6.12	15½	27.73	27½	52.06
4	7.00	16	28.68	28	53.17
4½	7.87	16½	29.62	28½	54.30
5	8.75	17	30.57	29	55.43
5½	9.63	17½	31.53	29½	56.58
6	10.51	18	32.49	30	57.74
6½	11.39	18½	33.46	30½	58.91
7	12.28	19	34.43	31	60.09
7½	13.17	19½	35.41	31½	61.28
8	14.05	20	36.40	32	62.49
8½	14.95	20½	37.39	32½	63.71
9	15.84	21	38.39	33	64.94
9½	16.73	21½	39.39	33½	66.19
10	17.63	22	40.40	34	67.45
10½	18.53	22½	41.42	34½	68.73
11	19.44	23	42.45	35	70.02
11½	20.35	23½	43.48	35½	71.33
12	21.26	24	44.52	36	72.65

Tire Loads and Inflation Pressures

FORMER RECOMMENDATIONS

Size of tire, in	2½	3	3½	4	4½	5	5½	6
Maximum load on wheel, pounds	225	350	600	750	1000	1000		
Inflation pressure, pounds per sq. in	50	60	70	80	90	90		

REVISED RECOMMENDATIONS

(Proposed S. A. E. Standard, 1917)

Size of tire, in	2½	3	3½	4	4½	5	5½	6
Maximum load on wheel, pounds		375	570	815	1100	1300	1700	2000
Inflation pressure, pounds per sq. in		45	55	65	75	80	85	90

In these recommendations, all allowances for diameters, load variations and different capacity of front and rear tires are set aside as useless. In practice inflation pressures are not changed for transitory load variations, while tire sizes are chosen with reference to average loads, and as road conditions and vehicle speed mean more for or against tire life than the minor factors (diameters, front and rear variation), the latter can be ignored and the chances for uniform practice thereby improved.

(*Continued on following page*)

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Tire Loads and Inflation Pressures

RECOMMENDED BY DIFFERENT TIRE MANUFACTURERS

Several tire manufacturers refrain from giving directions. Others recommend the S. A. E. schedule. Varying recommendations are given in the following, slightly abbreviated:

Continental Rubber Works: Twenty pounds pressure per inch of tire cross-section. No load rule.

Quaker: Same.

National Rubber Co.: Same inflation (20 pounds per inch). Load rule for car "without passengers":

Cross section	3	3½	4	4½	5		
Diameter	28 to 30	30 to 34	31 to 36	34 to 36	35 to 37		
Wheel oad	350	450 to 600	600 to 750	900 to 950	1000 to 1100		

Portage Rubber Co.: Same inflation (20 pounds per inch). Load rule, for "gross weights." Distinguishes between front and rear tires:

Cross section	3	3½	4	4½	5		
Diameter	28 to 32	30 to 36	30 to 40	32 to 42	35 to 38		
Rear wheel load	350 to 375	450 to 600	625 to 850	750 to 1200	1000 to 1200		
Front wheel load	425 to 450	550 to 700	750 to 1000	950 to 1450	1250 to 1450		

Hood: Inflation about 18 pounds per inch. Recommends rear tires stronger than front tires. Scale as follows:

Cross section	3	3½	4	4½	5	5½	
Diameter	28 to 34	30 to 34	31 to 37	32 to 37	35 to 37	37 to 38	
Inflation	55	65	70	80	90	100	
Wheel load	300 to 400	400 to 475	675 to 825	850 to 975	1050 to 1100	1275 to 1300	

Mason: Loads are per "gross weights." Odd sizes intended as oversize tires for smaller rims have relatively reduced loads.

Cross section	3	3½	4	4½	5	5½	6
Diameter	28 to 32	29 to 34	30 to 37	32 to 41	34 to 43	36 to 38	39
Inflation	60	70	80	90	90	100	100
Rear wheel load	350 to 375	400 to 600	600 to 750	725 to 1125	1000 to 1450	1200 to 1400	1600
Front wheel load	425 to 450	475 to 700	730 to 900	875 to 1375	1250 to 1700	1500 to 1600	1750

Century-Plainfield tires follow practically the same schedule.

Acme: Loads are for "gross weights." Inflation uniformly 20 pounds per inch.

Cross section	3	3½	4	4½	5	5½	
Diameter	28 to 32	28 to 36	30 to 36	32 to 38	35 to 43	36 to 38	
Inflation	60	70	80	90	100	110	
Rear wheel load	350 to 375	425 to 600	625 to 750	750 to 1050	1000 to 1450	1300 to 1400	
Front wheel load	425 to 450	500 to 700	750 to 900	950 to 1300	1250 to 1650	1550 to 1650	

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Fisk Rubber Co. gives a scale which in practice varies little from the proposed S. A. E Standard, with inflation pressures close to 15 pounds per inch of cross-section, as follows:

Tire Sizes	Maximum weight per wheel with load (including passengers) for sizes specified (Weight includes 150 lbs. for each passenger and 100 lbs. for extra equipment.)													
	300	400	500	600	700	800	900	1000	1200	1400	1600	1800	2000	2200
3 × 28–34	60	65												
3½ × 30–32		60	65	70										
34–36			65	70	75									
4 × 32–36				65	70	75	80							
38–42					65	70	75	80						
4½ × 34–36							70	75	80	85				
38–42								70	75	80	85			
5 × 36									75	80	85			
38–40										75	80	85		
5½ × 38–40				Air	Pre	ssur	es					80	90	
6 × 40													85	95

Miller Rubber Co. presents a sliding scale of loads and inflation pressures for each tire size, as follows:

Size	Weight Carried	Air Pressure
28 × 3	250 lbs.— 400 lbs.	35 lbs.— 50 lbs.
30 × 3	300 " — 500 "	35 " — 55 "
30 × 3½	400 " — 650 "	45 " — 65 "
31 × 3½	300 " — 650 "	40 " — 65 "
32 × 3½	500 " — 700 "	50 " — 65 "
31 × 4	500 " — 800 "	45 " — 65 "
32 × 4	600 " — 850 "	50 " — 70 "
33 × 4	650 " — 850 "	55 " — 75 "
34 × 4	700 " — 950 "	55 " — 80 "
36 × 4	700 " — 950 "	55 " — 80 "
34 × 4½	800 " —1000 "	50 " — 80 "
35 × 4½	800 " —1000 "	50 " — 80 "
36 × 4½	900 " —1200 "	55 " — 85 "
37 × 4½	900 " —1300 "	60 " — 85 "
35 × 5	900 " —1350 "	60 " — 90 "
36 × 5	1000 " —1450 "	65 " — 90 "
37 × 5	1050 " —1600 "	65 " — 90 "
38 × 5½	1100 " —1900 "	65 " —100 "

Michelin prescribes finding front and rear axle loads with all seats occupied and gasoline and water tanks filled. Apart from oversize tires, the following scale is then recommended (ignoring diameters):

Axle Loads, Lbs.	Tire Sizes	Inflation Pressure, Lbs.
600 to 800	3	45
800 to 1000	3	50
600 to 1000	3½	50
1000 to 1400	3½	60
1400 to 1800	3½	70
1200 to 1600	4	50
1600 to 2000	4	60
2000 to 2400	4	70
1600 to 2000	4½	55
2000 to 2400	4½	65
2400 to 2800	4½	75
2200 to 2600	5	55
2600 to 3000	5	65
3000 to 3400	5	75

(*Continued on following page*)

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Republic Rubber Co. presents another elaborate scale as follows:

Inflation Pressure	Weights per wheel that may be carried under each tire section diameter						
	3"	3½"	4"	4½"	5"	5½"	6"
30	240						
35	280	350					
40	325	400	485				
45	365	450	545	660			
50	**405**	505	610	735	860	985	1125
55	450	**555**	675	810	945	1085	1240
60	490	605	**735**	885	1035	1185	1355
65		660	800	**960**	1120	1285	1465
70		710	860	1035	**1210**	1385	1580
75			925	1110	1295	**1485**	1700
80			985	1185	1385	1585	1910
85				1260	1470	1685	1925
90				1335	1555	1785	2035
95					1645	1885	2150
100						1985	2265

and adds the following directions:

"Pressure varies according to amount of load carried. Weigh separately front and rear of fully loaded car, and divide each weight by two, this will give the weight on each wheel. The tire should be inflated to the pressure given in the extreme left hand column that most nearly corresponds to the load weight under sectional diameter of tire used.

"Heavy-faced type in each column shows the ideal load for rear wheels. A heavier load, as figures under each sectional diameter indicate, may be carried, but owing to the added air pressure necessary to get good tire mileage, it is not desirable. Loads should not exceed the maximum figures at the bottom of each column."

Goodyear Tire & Rubber Co. presents a scale identical with the preceding one, excepting that the prescribed loads are 10 to 15 pounds higher, and that 10 per cent lower inflation pressures are recommended for cord tires.

For *United States* tires a uniform scale of 20 pounds of inflation pressure per inch of tire section is recommended (including 120 pounds pressure for 6-inch tires) in conjunction with a load scale, about which it is said: "The following is a list of the weights which tires of the different sizes are designed to carry, sufficient allowance being made for the usual number of passengers (cars to be weighed without passengers or luggage)":

Tire Dimensions	Rear Weight per Wheel, Lbs.	Front Weight per Wheel, Lbs.	Tire Dimensions	Rear Weight per Wheel, Lbs.	Front Weight per Wheel, Lbs.	Tire Dimensions	Rear Weight per Wheel, Lbs.	Front Weight per Wheel, Lbs.
28 × 3	350	425	34 × 4	700	875	34 × 5	950	1200
30 × 3	375	450	35 × 4	735	885	35 × 5	1000	1250
32 × 3	375	450	36 × 4	750	900	36 × 5	1050	1300
			37 × 4	800	925	37 × 5	1100	1350
28 × 3½	425	500	40 × 4	850	1000	39 × 5	1200	1450
29 × 3½	425	500	42 × 4	900	1050	43 × 5	1400	1550
30 × 3½	450	550						
31 × 3½	475	575						
32 × 3½	500	600	32 × 4½	750	950	34 × 5½	1000	1250
33 × 3½	525	625	33 × 4½	800	1000	35 × 5½	1050	1300
34 × 3½	550	650	34 × 4½	900	1125	36 × 5½	1100	1350
36 × 3½	600	700	35 × 4½	935	1175	37 × 5½	1150	1400
			36 × 4½	975	1225	38 × 5½	1200	1450
30 × 4	625	750	37 × 4½	1010	1260			
31 × 4	635	775	38 × 4½	1050	1300			
32 × 4	650	800	40 × 4½	1100	1350	37 × 6	1600	1750
33 × 4	675	850	42 × 4½	1200	1450	39 × 6	1800	2000

(*Continued on following page*)

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For *Kelly-Springfield* tires the following list is given, the weights to be understood as "gross weights per wheel (car empty)":

Size	Inflation Pressure, Lbs.	Rear Weight, Lbs.	Front Weight, Lbs.	Size	Inflation Pressure, Lbs.	Rear Weight, Lbs.	Front Weight, Lbs.
28 × 3	60	350	450	32 × 4½	85	800	975
30 × 3	60	375	475	33 × 4½	85	850	1050
32 × 3	60	375	475	34 × 4½	85	900	1125
				35 × 4½	85	950	1150
30 × 3½	65	475	575	36 × 4½	85	1000	1225
31 × 3½	65	500	600	37 × 4½	85	1050	1250
32 × 3½	65	525	625	38 × 4½	85	1100	1300
33 × 3½	65	550	650	40 × 4½	85	1125	1375
34 × 3½	65	575	675	42 × 4½	85	1250	1450
36 × 3½	65	600	700				
30 × 4	75	550	700	34 × 5	90	1000	1250
31 × 4	75	575	725	35 × 5	90	1050	1300
32 × 4	75	600	750	36 × 5	90	1100	1350
33 × 4	75	625	775	37 × 5	90	1150	1400
34 × 4	75	650	800	39 × 5	90	1250	1500
35 × 4	75	675	825				
36 × 4	75	700	850	36 × 5½	100	1275	1500
37 × 4	75	725	875	37 × 5½	100	1300	1550
40 × 4	75	800	950	38 × 5½	100	1350	1600
				39 × 6	100	1600	1750

In addition, millimeter sizes and interchangeable sizes are listed.

For *Goodrich* tires no scale of inflation pressures or maximum loads is offered. The use of an instrument called the Goodrich Tire Caliper-Gauge is recommended as more satisfactory, in the following words:

"A tire must be inflated for the load which it actually carries; an arbitrary inflation schedule of 18 or 20 pounds pressure per cross sectional inch is fallacious. Obviously it is foolish to use the same pressure for a four-inch tire carrying 400 lbs. weight on a roadster as that in a four-inch tire carrying 750 lbs. weight on a touring car.

"The Goodrich Tire Caliper-Gauge measures the flattening or deflection of the tire at the point where it touches the ground. If the deflection is so great that the tire will be injured when running, the Caliper-Gauge indicates that fact exactly. It is the only scientific wey of procuring inflation for the load which the tire actually carries."

The *Firestone* Tire and Rubber Co. recommends for front wheels 15 to 18 pounds of inflation per inch of tire section and for rear wheels 15 to 20 pounds. The loads ("per wheel, car empty") are given in the following scale with the reminder: "These weights are influenced by extra passengers, luggage, power and speed of the car and the construction as before mentioned, therefore in some instances it will be necessary to equip with larger tires. Refer to *Oversize Tires*."

Size	Rear, Lbs.	Front, Lbs.	Size	Rear, Lbs.	Front, Lbs.	Size	Rear, Lbs.	Front, Lbs.
28 × 3	350	450	34 × 4	650	800	33 × 5	950	1200
30 × 3	375	475	35 × 4	675	825	34 × 5	1000	1250
32 × 3	375	475	36 × 4	700	850	35 × 5	1050	1300
34 × 3	400	500	37 × 4	725	875	36 × 5	1100	1350
36 × 3	425	525	38 × 4	750	900	37 × 5	1150	1400
			40 × 4	800	950	38 × 5	1200	1450
29 × 3½	450	550	42 × 4	850	1000	39 × 5	1250	1500
30 × 3½	475	575				41 × 5	1350	1600
31 × 3½	500	600				43 × 5	1450	1700
32 × 3½	525	625	32 × 4½	800	1000			
33 × 3½	550	650	33 × 4½	850	1050	36 × 5½	1250	1500
34 × 3½	575	675	34 × 4½	900	1100	37 × 5½	1300	1550
36 × 3½	625	700	35 × 4½	950	1150	38 × 5½	1350	1600
			36 × 4½	1000	1200	40 × 5½	1450	1700
30 × 4	550	700	37 × 4½	1050	1250			
31 × 4	575	725	38 × 4½	1100	1300	37 × 6	1350	1600
32 × 4	600	750	40 × 4½	1200	1400	39 × 6	1450	1700
33 × 4	625	775	42 × 4½	1300	1500	41 × 6	1550	1800

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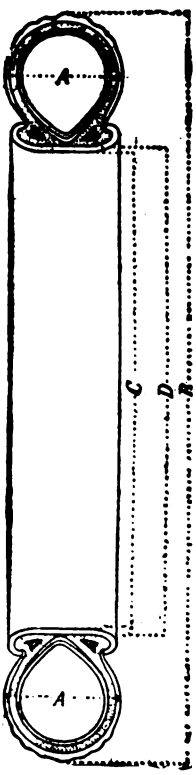
Approximate Wood Wheel Diameters for Various Sizes and Types of Rims

Size Tire	Clincher, Universal and Stanweld Detachable	Firestone Demountable	Fisk Bolted On	Fisk Demountable	Stanweld Demountable	Stanweld Demountable Metric Sizes
30 × 3½	22 11/16	21 11/16	21 13/16	19 9/16	22	.....
32 × 3½	24 11/16	23 11/16	23 13/16	21 9/16	24	810 × 90 – 23 9/16
34 × 3½	26 11/16	25 11/16	25 13/16	23 9/16	26	870 × 90 – 25 9/16
36 × 3½	28 11/16	27 11/16	27 13/16	.....	28	910 × 90 – 27 9/16
30 × 4	21 11/16	20 11/16	20 9/16	.....	21	.....
32 × 4	23 11/16	22 11/16	22 9/16	20	23	.....
34 × 4	25 11/16	24 11/16	24 9/16	22	25	875 × 105 – 25 9/16
36 × 4	27 11/16	26 11/16	26 9/16	24	27	915 × 105 – 27 9/16
32 × 4½	22 21/32	21 21/32	21½	.....	.....	820 × 120 – 21 17/64
34 × 4½	24 21/32	23 21/32	23½	20 15/16	23 55/64	880 × 120 – 23 47/64
36 × 4½	26 21/32	25 21/32	25½	22 15/16	25 55/64	920 × 120 – 25 9/16
34 × 5	23 21/32	22 21/32	.....	19 15/16	22 55/64	.....
36 × 5	25 21/32	24 21/32	.....	21 15/16	24 55/64	.....
36 × 5½	24 21/32	23 21/32	.....	.....	.....	935 × 135 – 24 7/64
37 × 5½	25 21/32	24 21/32	.....	.....	24 7/64	.....



Clincher Tire and Rim Dimensions

A Inches	B Inches	C Inches	D Inches
2½	26	20 9/16	21
3	26	19 9/16	20
2½ and 3	28	21 9/16	22
2½ and 3	30	23 9/16	24
3	32	25 9/16	26
3	34	27 9/16	28
3	36	29 9/16	30
3½	28	20 11/16	21
3½	30	22 11/16	23
3½	32	24 11/16	25
3½	34	26 11/16	27
3½	36	28 11/16	29
4	30	21 11/16	22
4	32	23 11/16	24
4	34	25 11/16	26
4	36	27 11/16	28
4½	32	22 11/16	23
4½	34	24 11/16	25
4½	36	26 11/16	27

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Automobile Wheel Data

The following information is approximately correct, but the weights, etc., may vary according to the height of wheels, etc.:

Weight of Wheels per Set of Four

Weight of wheels and hubs without ribs or channels, size of spoke ⅞ to 1" or 1⅛", about	50	pounds
Weight, same size with steel rims for 2½" or 3" tire	110	"
Weight, 1" or 1⅛" spokes	65	"
Weight, including rims for 3" or 3½" tires	145	"
Weight, 1¼" or 1⅜" spokes	100	"
Weight, including rims for 3½" or 4" tires	210	"
Weight, 1⅜" or 1½" spokes	112	"
Weight, including rims for 4" or 4½" tire	250	"

Axles are not included in above.

Metric Tires and Their American Equivalents

Metric Sizes	Approximate Size in Inches	Metric Sizes	Approximate Size in Inches
650 × 65	26 × 2½	870 × 90	34 × 3½
700 × 65	28 × 2½	910 × 90	36 × 3½
750 × 65	30 × 2½	960 × 90	38 × 3½
800 × 65	32 × 2½	1010 × 90	40 × 3½
830 × 65	33 × 2½	815 × 105	32 × 4
860 × 65	34 × 2½	875 × 105	34 × 4
700 × 85	28 × 3½	915 × 105	36 × 4
750 × 85	30 × 3½	820 × 120	32 × 4½-5
800 × 85	32 × 3½	850 × 120	33 × 4½-5
860 × 85	34 × 3½	880 × 120	34 × 4½-5
760 × 90	30 × 3½	920 × 120	36 × 4½-5
810 × 90	32 × 3½	1020 × 120	40 × 4½-5
840 × 90	32 × 3½	1080 × 120	42 × 4½-5

Speedometer and Odometer Readings.

Odometers serve mainly the following purposes:

1—To ascertain the mileage of tires.
2—To keep track of monthly and yearly service of a vehicle.
3—To furnish a control upon the daily work of drivers.
4—To check illegitimate use of a vehicle.
5—To ascertain mileage of a day's journey or a tour.

If driven from a front wheel the odometer will record the slippage as well as the mileage of the front wheel.

If driven from a rear wheel, it will record slippage (spinning) as well as mileage of that wheel.

If driven from a transmission shaft, it will record slipping (spinning) of both rear wheels.

It seems to be the consensus of opinion that these sources of error are negligible so far as any of the purposes above mentioned are concerned.

Error due to insufficient inflation of air tires is also negligible, as either the soft tire maintains contact with the ground along the entire circumference of its tread—the circumference being merely ovalized—or else, in the case of a flat tire whose tread buckles under the driving effort, very little distance is covered under the abnormal condition.

Errors due to roughness of road are found to compensate for themselves, the bounding and the indentations of the tread resulting as often in advancement as in retardation.

The only notable error arises in connection with commercial motor vehicles when the wheel diameter is reduced by the wearing down of solid rubber tires.

Reliable data on speedometer and odometer readings have not yet been systematically gathered.

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Width and Depth of Piston Ring Grooves

A formula developed from approved practice with iron or steel cylinders and pistons has

$$G = \sqrt{\frac{0.01\ D^2}{8} + 0.005}$$

in which G is the depth of the piston ring groove and D the *nominal* diameter of the piston in inches. It is applicable for diameters from 1 to 7 inches and for concentric as well as eccentric rings. The width of rings and grooves can be standardized in five dimensions, as given in the appended table. As diameter H of groove bottom plus $2\ G$ equals *actual* piston diameter, piston clearance $= \frac{D - (2G + H)}{2}$

Diameter (D)	Depth (G)	Max'm Diameter H of Groove Bottom (Minus Tolerance 0.005)	Minimum Groove Width (Plus Tolerance 0.001)	Maximum Ring Width (Minus Tolerance 0.001)
1	.0791	.840	.1250	.1247
1⅛	.0811	.961	"	"
1¼	.0834	1.081	"	"
1⅜	.0858	1.201	"	"
1½	.0884	1.321	"	"
1⅝	.0911	1.440	"	"
1¾	.0939	1.559	"	"
1⅞	.0969	1.678	"	"
2	.1000	1.796	"	"
2⅛	.1032	1.915	"	"
2¼	.1064	2.035	"	"
2⅜	.1098	2.151	"	"
2½	.1132	2.269	"	"
2⅝	.1167	2.387	.1875	.1872
2¾	.1202	2.505	"	"
2⅞	.1238	2.622	"	"
3	.1275	2.739	"	"
3⅛	.1312	2.857	"	"
3¼	.1349	2.974	"	"
3⅜	.1387	3.091	"	"
3½	.1425	3.208	"	"
3⅝	.1464	3.325	"	"
3¾	.1503	3.442	"	"
3⅞	.1542	3.559	"	"
4	.1581	3.676	"	"
4⅛	.1621	3.793	.2500	.2497
4¼	.1661	3.910	"	"
4⅜	.1701	4.027	"	"
4½	.1741	4.143	"	"
4⅝	.1782	4.260	"	"
4¾	.1822	4.377	"	"
4⅞	.1863	4.493	"	"
5	.1904	4.610	"	"
5⅛	.1945	4.726	.3125	.3120
5¼	.1986	4.843	"	"
5⅜	.2028	4.959	"	"
5½	.2069	5.076	"	"
5⅝	.2111	5.182	"	"
5¾	.2152	5.309	"	"
5⅞	.2194	5.425	"	"
6	.2236	5.541	"	"
6⅛	.2278	5.658	.3750	.3745
6¼	.2320	5.774	"	"
6⅜	.2362	5.890	"	"
6½	.2404	6.007	"	"
6⅝	.2447	6.123	"	"
6¾	.2489	6.239	"	"
6⅞	.2531	6.356	"	"
7	.2574	6.472	"	"

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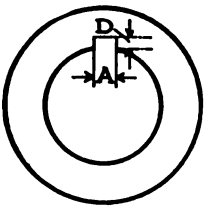

Data for Keyseats and Keyways

(American Machinist)

Standard Sizes of Keyseats

For straight keys, height of keyseat throughout = D.
For feather keys, $D = \frac{1}{2}A$.
Keyseat in shaft same depth as D in small end.
Standard taper = ⅛ inch per foot.

Size of Bore, Inches	"A." Width, Inches	"D." Smallest Height, Inches	Size of Bore, Inches	"A." Width, Inches	"D." Smallest Height, Inches
1 to 1⅛	¼	5/32	2 1/16 to 2⅞	11/16	19/64
1 3/16 to 1⅜	5/16	7/64	2 15/16 to 3½	¾	½
1 7/16 to 1⅝	⅜	⅛	3 1/16 to 3⅜	13/16	17/64
1 11/16 to 1⅞	7/32	9/64	3 7/16 to 3⅝	⅞	19/64
1 15/16 to 2⅛	½	11/64	3 11/16 to 3⅞	15/16	5/16
2 3/16 to 2⅜	9/16	5/16	3 15/16 to 4½	1	11/32
2 7/16 to 2⅝	⅝	13/64	4 5/16 to 4⅝	1 1/16	11/32

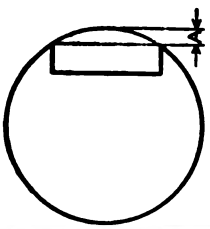

Table for Total Keyway Depth

This table will be found very useful in feeding the milling cutter down into a shaft. Having the size of the shaft to be keywayed, look down the column marked "Size of Shaft" until you come to the number representing that size; then follow this line to the right until you reach the column representing the size keyway, and the decimal there represented is the distance "A," which added to the depth of the keyway will give the total depth from the point where the cutter first begins to cut.

Size of Shaft, Inches	Width of Keyway in Inches				
	¼	5/16	⅜	7/16	½
	"A" in Inches				
½	0.0325				
9/16	0.0289				
⅝	0.0254	0.0413			
11/16	0.0236	0.0379			
¾	0.0220	0.0346	0.0511		
13/16	0.0198	0.0314	0.0465		
⅞	0.0177	0.0283	0.0420	0.0583	
15/16	0.0164	0.0264	0.0392	0.0544	
1	0.0152	0.0246	0.0365	0.0506	0.0670
1 1/16	0.0143	0.0228	0.0342	0.0476	0.0625
1⅛	0.0136	0.0210	0.0319	0.0446	0.0581
1 3/16	0.0131	0.0204	0.0304	0.0441	0.0551
1¼	0.0127	0.0198	0.0290	0.0397	0.0522
1 5/16	0.0123	0.0191	0.0279	0.0380	0.0499
1⅜	0.0120	0.0185	0.0268	0.0364	0.0477
1 7/16	0.0114	0.0174	0.0254	0.0346	0.0453
1½	0.0110	0.0164	0.0240	0.0328	0.0429
1 9/16	0.0107	0.0158	0.0231	0.0309	0.0412
1⅝	0.0105	0.0153	0.0221	0.0291	0.0395
1 11/16	0.0102	0.0147	0.0214	0.0282	0.0383
1¾	0.0099	0.0142	0.0207	0.0274	0.0371
1 13/16	0.0095	0.0136	0.0198	0.0265	0.0355
1⅞	0.0093	0.0130	0.0190	0.0257	0.0339
1 15/16	0.0090	0.0127	0.0184	0.0250	0.0328
2	0.0088	0.0124	0.0179	0.0243	0.0317
2⅛	0.0078	0.0111	0.0168	0.0229	0.0299
2¼	0.0070	0.0107	0.0159	0.0216	0.0282
2⅜	0.0066	0.0102	0.0152	0.0202	0.0267
2½	0.0063	0.0098	0.0146	0.0194	0.0253
2⅝	0.0060	0.0090	0.0139	0.0185	0.0242
2¾	0.0058	0.0088	0.0133	0.0176	0.0230
2⅞	0.0056	0.0084	0.0126	0.0168	0.0220
3	0.0053	0.0081	0.0119	0.0161	0.0211

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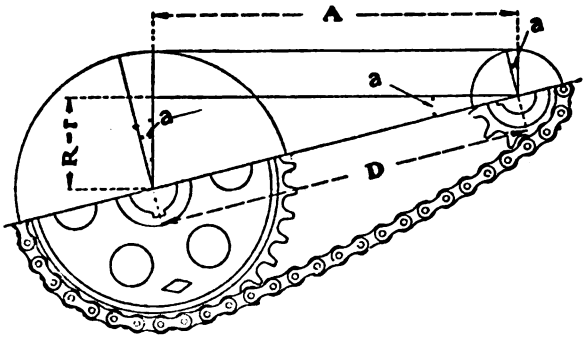
Length of Sprocket Chains



D = Distance between centers.

A = Distance between limits of contact.

R = Pitch radius of large sprocket.

r = Pitch radius of small sprocket.

N = Number of teeth on large sprocket.

n = Number of teeth on small sprocket.

P = Pitch of chain and sprockets. (Distance from center to center of chain pins.)

$180° + 2a$ = Angle of contact—large sprocket.

$180° - 2a$ = Angle of contact—small sprocket.

$$\text{Sin } a = \frac{R - r}{D}$$

$$A = D \cos a$$

Length of chain = L

$$(1) \qquad L = \frac{(90 + a)\,NP}{180} + \frac{(90 - a)\,nP}{180} + 2A$$

With only R, r and D known, the length of a sprocket chain can be figured with sufficient accuracy (very slightly short) from the formula.

$$(2) \qquad L = (R + r)\,\pi + 2\sqrt{D^2 - (R - r)^2} + \frac{2\,(R - r)^2}{D}$$

which is simple when figures are inserted.

For example, with $R = 6$, $r = 2$ and $D = 20$,

$$L = 8 \times 3.1416 + 2\sqrt{400 - 16} + \frac{32}{20} = 25.133 + 2 \times 19.60 + 1.60 = 65.93.$$

The figure obtained is rounded upward to allow for slack and to correspond to a multiple of chain pitch.

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Compression Pressure with Different Cylinder Clearances

From S. A. E. DATA SHEET——Computed by Cecil P. Poole

Cylinder Clearance, in percent of Piston Displacement	Mechanical Compression Ratio	Compression Pressure, Pounds per Square Inch Absolute		
		Low	Medium	High
20	6.	100	130	154
21	5.76	95	125	145
22	5.55	91	120	138
23	5.35	87	115	132
24	5.17	83	110	126
25	5.	80	105	121
26	4.85	77	101	116
27	4.70	74	97	111
28	4.57	71½	94	107
29	4.45	69	90	103
30	4.33	67	87	99
31	4.23	65	84	96
32	4.125	63	81½	93
33	4.03	61½	79	91
34	3.94	60	77	88
35	3.86	58	75	85
36	3.78	56½	73	83
37	3.70	55	71	81
38	3.63	54	69	79
39	3.56	53	67½	77
40	3.5	52	66	75

In computing the values given in the table, the formula

$$p_c = p_a \left[\frac{V_a}{V_c} \right]^n$$

was used, in which the values for absolute pressure (p_a) in the cylinder before compression, and the exponent (n) are the average values taken from 96 indicator diagrams made on three engines, one having a normal compression pressure of 45 lbs., another 60 lbs. and a third 71 lbs. These values were:

Nature of Engine	p_a (Lbs. per Sq. In. Absolute)	n
Low pressures	11½	1.21
Medium pressures	13	1.29
High pressures	14	1.34

[The mechanical compression ratios of the three engines are not given. On the justifiable assumption that they were low, medium and high, the least reliable figures in the above table have been printed in small type.—AUTOMOBILE TRADE DIRECTORY.]

FLUCTUATIONS OF COMPRESSION

Compression pressure in engine cylinders is understood as the maximum pressure obtainable in operation of the engine under load. When C is volume of combustion chamber and A the piston displacement, the actual compression is $\frac{A+C}{C} \times 14.7$ lbs. $\times Y$, and the factor Y varies in practice over a wide range, subject to variable influences whose quantitative effect cannot be ascertained in advance. Y grows smaller with increasing initial temperature of the explosive charge, but larger with increasing temperature of piston and cylinder. With a given condition of piston ring action, Y grows smaller or larger according to the properties of the lubricating oil, its temperature and the rate at which it is fed. Ordinarily Y increases with increase of piston speed—the oil film becoming more resistant—but it is reduced with decreasing volumetric efficiency.

Index to Tables and Data appears on Pages 777 and 778.

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Equivalent Values of Electrical, Mechanical and Heat Units

Unit	Equivalent Value in Other Units	
1 K. W. Hour =	1,000	watt hours.
	1.341	horse-power hours.
	2,655,180	ft.-lbs.
	3,600,000	joules.
	3.415	heat-units.
	367,100	kilogram meters.
	0.234	lb. carbon oxidized with perfect efficiency.
	3.52	lbs. water evaporated from and at 212 degrees F.
	22.77	lbs. of water raised from 62 degrees to 212 degrees F.
1 H. P. Hour =	0.7457	K. W. hour.
	1,980,000	ft.-lbs.
	2,546.5	heat-units.
	273,740	kilogram meters.
	0.174	lb. carbon oxidized with perfect efficiency.
	2.62	lbs. water evaporated from and at 212 degrees F.
	17.0	lbs. water raised from 62 degrees F. to 212 degrees F.
1 Kilo-watt =	1,000	watts.
	1.3410	horse-power.
	2,655,180	ft.-lbs. per hour.
	44,253	ft.-lbs. per minute.
	737.56	ft.-lbs. per second.
	3.415	heat-units per hour.
	56.92	heat-units per minute.
	0.9846	heat-units per second.
	0.234	lb. carbon oxidized per hour.
	3.52	lbs. water evap. per hour from and at 212 degrees.
1 H. P. =	745.7	watts.
	0.7457	K. W.
	33,000	ft.-lbs. per minute.
	550	ft.-lbs. per second.
	2,546.5	heat-units per hour.
	42.44	heat-units per minute.
	0.707	heat-units per second.
	0.174	lb. carbon oxidized per hour.
	2.62	lbs. water evap. per hour from and at 212 degrees F.
1 Joule =	1	watt second.
	0.000000278	K. W. hour.
	0.102	kilogram meters.
	0.0009486	heat-units.
	0.73756	ft.-lb.

(*Continued on following page*)

Index to Tables and Data appears on Pages 777 and 778.

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Equivalent Values of Electrical, Mechanical and Heat Units

Unit	Equivalent Value in Other Units
1 Ft.-lb. =	1.3558 joules. 0.13826 kilogram meters. 0.0000003766 K. W. hour. 0.0012861 heat-unit. 0.0000005 H. P. hour.
1 Watt =	1 joule per second. 0.001341 H. P. 3.415 heat-units per hour. 0.73756 ft.-lb. per second. 0.0035 lb. water evap. per hour. 44.254 ft.-lbs. per minute.
1 Watt per sq. in. =	8.20 heat-units per sq. ft. per minute. 6,373 ft.-lbs. per sq. ft. per minute. 0.1931 H. P. per sq. ft.
1 Heat-unit =	1,054.2 watt seconds. 777.54 ft.-lbs. 107.5 kilogram meters. 0.0002928 K. W. hour. 0.0003927 H. P. hour. 0.0000685 lb. carbon oxidized. 0.001030 lb. water evap. from and at 212 degrees F.
1 Heat-unit per sq. ft. per min. =	0.1220 watt per sq. in. 0.01757 K. W. per sq. ft. 0.02356 H. P. per sq. ft.
1 Kilogram Meter =	7.233 ft.-lbs. 0.000003653 H. P. hour. 0.000002724 K. W. hour. 0.009302 heat-unit.
1 lb. Carbon Oxidized with perfect efficiency =	14,600 heat-units. 1.11 lbs. anthracite coal oxidized. 2.5 lbs. dry wood oxidized. 22 cubic feet illuminating-gas. 4.275 K. W. hours. 5.733 H. P. hours. 11,352,000 ft.-lbs. 15.05 lbs. of water evap. from and at 212 degrees F.
1 lb. Water Evap. from and at 212 degrees F. =	0.2841 K. W. hour. 0.3811 H. P. hour. 970.4 heat-units. 104,320 kilogram meters. 1,023,000 joules. 754,525 ft.-lbs. 0.066466 lb. carbon oxidized.

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Approximate Capacities in Liquid Gallons of Cylindrical Tanks

1	2	3	4	5	6	7	8	9	10	Gallons	Gal'ns per Inch
5x12	6x18	6x24	6x36	6x42						6" diam'r	.122
	7x12	7x18	7x24	7x30	7x36	7x42	7x48			7" "	.165
		8x15	8x18	8x24	8x30	8x36	8x42	8x45	8x48	8" "	.217
		9x12	9x15	9x18	9x24	9x30	9x34	9x36	9x40	9" "	.275
					10x20	10x24	10x26	10x28	10x32	10" "	.340
						12x16	12x18	12x20	12x24	12" "	.486

10	15	20	25	30	35	40	45	50	Gallons	Gal'ns per Inch
8x48									8" diam'r	.217
9x40									9" "	.275
10x32	10x48								10" "	.340
12x24	12x34	12x42	12x50	12x60					12" "	.486
14x18	14x24	14x30	14x38	14x44	14x52	14x60			14" "	.666
	16x18	16x24	16x30	16x36	16x42	16x48	16x54	16x60	16" "	.870

Weights, Fusion Points and Conductivity of Metals

	Pounds per Cu. Ft.	Specific Gravity	Fusion Point	Heat Conductivity	Electric Conductivity
Aluminum	166	2.66	1159	313	551
Antimony	418	6.70	800	40	42
Babbitt metal	440	7.18	....	....	....
Bismuth	607	9.74	511	18	12
Brass, cast	505	8.10	....	....	....
Brass, rolled	525	8.40	....	....	....
Bronze, aluminum	471	7.55	....	....	....
Bronze, phosphor	576	9.23	....	....	....
Copper, cast	542	8.70	1922	736	999
Copper, rolled	555	8.90	....	....	....
Gold, 24 carat	1204	19.26	1913	532	806
Iron, cast	450	7.21	....	....	....
Iron, wrought	480	7.90	....	119	164
Iron, pure	....	....	2912	....	....
Lead, commercial	710	11.38	621	85	88
Mercury, 60F	846	13.58	....	13	25
Nickel	549	8.80	2640	....	79
Platinum	1342	21.50	3230	84	167
Silver	655	10.50	1742	1000	1000
Steel, Bessemer	490	7.85	....	....	....
Tin	459	7.35	450	152	152
Zinc	437	7.15	783	....	....

Heat and electric conductivity are measured in comparison with these properties in silver.

The weight of a cubic foot of distilled water is in pounds, 62.47 at 32 deg. F., 62.425 at 39 deg. F., 62.355 at 62 deg. F., 59.700 at 212 deg. F., and 57.400 as ice.

Index to Tables and Data appears on Pages 777 and 778.

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Weight in Pounds of a Linear Foot of Round, Square and Octagon Steel

Size in Inches	Round	Octagon	Square	Size in Inches	Round	Octagon	Square
1/16	.010	.011	.013	2 1/2	16.79	17.71	21.37
1/8	.042	.044	.053	2 5/8	18.51	19.52	23.56
3/16	.094	.099	.120	2 3/4	20.31	21.42	25.86
1/4	.168	.177	.214	2 7/8	22.20	23.41	28.27
5/16	.262	.277	.334	3	24.17	25.50	30.78
3/8	.378	.398	.491	3 1/8	26.23	27.66	33.40
7/16	.514	.542	.655	3 1/4	28.37	29.92	36.12
1/2	.671	.708	.855	3 3/8	30.59	32.27	38.95
9/16	.850	.896	1.082	3 1/2	32.90	34.70	41.89
5/8	1.049	1.107	1.336	3 5/8	35.29	37.23	44.94
11/16	1.270	1.339	1.616	3 3/4	37.77	39.84	48.09
3/4	1.511	1.594	1.924	3 7/8	40.33	42.54	51.35
13/16	1.773	1.870	2.258	4	42.97	45.33	54.72
7/8	2.056	2.169	2.618	4 1/4	48.51	51.17	61.77
15/16	2.361	2.490	3.006	4 1/2	54.39	57.37	69.25
1	2.686	2.833	3.420	4 3/4	60.60	63.92	77.16
1 1/8	3.399	3.585	4.328	5	67.15	70.83	85.50
1 1/4	4.197	4.427	5.344	5 1/4	74.03	78.08	94.26
1 3/8	5.078	5.356	6.466	5 1/2	81.25	85.70	103.45
1 1/2	6.044	6.374	7.695	5 3/4	88.80	93.67	113.07
1 5/8	7.093	7.481	9.031	6	96.69	101.99	123.12
1 3/4	8.226	8.674	10.474	7	131.61	138.82	167.58
1 7/8	9.443	9.960	12.023	8	171.90	181.32	218.88
2	10.744	11.332	13.680	9	217.57	229.48	277.02
2 1/8	12.129	12.793	15.443	10	268.60	283.31	342.00
2 1/4	13.598	14.343	17.314	11	325.01	342.80	413.82
2 3/8	15.151	15.981	19.291	12	386.79	407.97	492.48

Proportionate Weight of Castings to Weight of Wood Patterns

A Pattern Weighing One Pound, Made of (Less Weight of Core Prints)	Cast Iron	Brass	Copper	Bronze	Bell Metal	Zinc
Pine or Fir	16	15.8	16.7	16.3	17.1	13.5
Oak	9	10.1	10.4	10.3	10.9	8.6
Beech	9.7	10.9	11.4	11.3	11.9	9.1
Linden	13.4	15.1	16.7	15.5	16.3	12.9
Pear	10.2	11.5	11.9	11.8	12.4	9.8
Birch	10.6	11.9	12.3	12.2	12.9	10.2
Alder	12.8	14.3	14.9	14.7	15.5	12.2
Mahogany	11.7	13.2	13.7	13.5	14.2	11.2
Brass	0.85	0.95	0.99	0.98	1.0	0.81

Index to Tables and Data appears on Pages 777 and 778.

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List of Nine Different Standard Wire Gauges Used In the United States.

DECIMAL EQUIVALENTS (Inches)

No. of Gauge	American or Brown & Sharpe Iron Wire	Birmingham or Stubbs Iron Wire	Washburn & Moen Iron Wire	Imperial Wire Gauge	U. S. Standard for Plate (Iron & Steel)	Stubbs Steel Wire	Twist Drill and Steel Wire	Washburn & Moen Music Wire	Wood and Machine Screws	No. of Gauge	Fractional Parts of an Inch	Decimal Equiv. of Sixty-fourths, etc.
8-0	.....	.....	.....	.....	.....	.....	This gauge	.0083	....	8-0	1/64	.01563
7-0	.....	.....	.....	.....	.500	.....	from one to	.0087	....	7-0	1/32	.03125
6-0	.....	.....	.....	.464	.469	.....	three thous-	.0095	....	6-0	1/16	.625
5-0	.....	.....	.....	.432	.438	.....	andths larger	.010	....	5-0	5/64	.07813
4-0	.460	.454	.394	.400	.406	.....	than same Nos.	.011	....	4-0	3/32	.09375
3-0	.410	.425	.363	.372	.375	.....	of Stubbs steel	.012	.032	3-0	7/64	.10938
2-0	.365	.380	.331	.348	.344	.....	wire gauge	.013	.045	2-0	1/8	.125
0	.325	.340	.307	.334	.313	.....		.014	.058	0	9/64	.14063
1	.289	.300	.283	.300	.281	.277	.228	.016	.071	1	5/32	.15625
2	.258	.284	.263	.276	.266	.219	.221	.017	.084	2	11/64	.17188
3	.229	.259	.244	.252	.250	.212	.213	.018	.097	3	3/16	.1875
4	.204	.238	.225	.232	.234	.207	.209	.019	.110	4	13/64	.20313
5	.182	.220	.207	.212	.219	.204	.206	.020	.124	5	7/32	.21875
6	.162	.203	.192	.192	.203	.201	.204	.022	.137	6	15/64	.23438
7	.144	.180	.177	.176	.188	.199	.201	.023	.150	7	1/4	.25
8	.128	.165	.162	.160	.172	.197	.199	.024	.163	8	17/64	.26563
9	.114	.148	.148	.144	.156	.194	.196	.026	.176	9	9/32	.28125
10	.102	.134	.135	.128	.141	.191	.194	.027	.189	10	19/64	.29688
11	.091	.120	.121	.116	.125	.188	.191	.028	.203	11	5/16	.3125
12	.081	.109	.106	.104	.109	.185	.189	.030	.216	12	21/64	.32813
13	.072	.095	.092	.092	.094	.182	.185	.031	.229	13	11/32	.34375
14	.064	.083	.080	.080	.078	.180	.182	.033	.242	14	23/64	.35938
15	.057	.072	.072	.072	.070	.178	.180	.035	.255	15	3/8	.375
16	.051	.065	.063	.064	.063	.175	.177	.036	.268	16	25/64	.39063
17	.045	.058	.054	.056	.056	.172	.173	.038	.282	17	13/32	.40625
18	.040	.049	.048	.048	.050	.168	.170	.040	.295	18	27/64	.42188
19	.036	.042	.041	.040	.044	.164	.166	.041	.308	19	7/16	.4375
20	.032	.035	.035	.036	.038	.161	.161	.043	.321	20	29/64	.45313
21	.028	.032	.032	.032	.034	.157	.159	.046	.334	21	15/32	.46875
22	.025	.028	.029	.028	.031	.155	.157	.048	.347	22	31/64	.48438
23	.023	.025	.026	.024	.028	.153	.154	.051	.360	23	1/2	.5
24	.020	.022	.023	.022	.025	.151	.152	.055	.374	24	33/64	.51563
25	.018	.020	.020	.020	.022	.148	.150	.059	.387	25	17/32	.53125
26	.016	.018	.018	.018	.019	.146	.147	.063	.400	26	35/64	.54688
27	.0141	.016	.0173	.0164	.0171	.143	.144	.066	.413	27	9/16	.5625
28	.0126	.014	.0162	.0149	.0156	.139	.141	.072	.426	28	37/64	.57813
29	.0112	.013	.015	.0136	.014	.134	.136	.076	.439	29	19/32	.59375
30	.010	.012	.014	.0124	.0125	.127	.129	.080	.453	30	39/64	.60938
31	.0089	.010	.0132	.0116	.0109	.120	.120	....	.466	31	5/8	.625
32	.0079	.009	.0128	.0108	.0101	.115	.116	....	.479	32	41/64	.64063
33	.007	.008	.0118	.010	.0093	.112	.113	....	.492	33	21/32	.65625
34	.0063	.007	.0104	.0092	.0085	.110	.111	....	.505	34	43/64	.67188
35	.0056	.005	.0095	.0084	.0078	.108	.110	....	.518	35	11/16	.6875
36	.005	.004	.009	.0076	.007	.106	.1065	....	.532	36	45/64	.70313
37	.0044	.....	.....	.0068	.0066	.103	.104	....	.545	37	23/32	.71875
38	.0039	.....	.....	.006	.0062	.101	.1015	....	.558	38	47/64	.73438
39	.0035	.....	.....	.0052	.....	.099	.0995	....	.571	39	3/4	.75
40	.0031	.....	.....	.0048	.....	.097	.098	....	.584	40	49/64	.76563
41	.....	.....	.....	.....	.....	.095	.096	....	.597	41	25/32	.78125
42	.....	.....	.....	.....	.....	.092	.094	....	.611	42	51/64	.79688
43	.....	.....	.....	.....	.....	.088	.089	....	.624	43	13/16	.8125
44	.....	.....	.....	.....	.....	.085	.086	....	.637	44	53/64	.82813
45	.....	.....	.....	.....	.....	.081	.082	....	.650	45	27/32	.84375
46	.....	.....	.....	.....	.....	.079	.081	....	.663	46	55/64	.85938
47	.....	.....	.....	.....	.....	.077	.079	....	.676	47	7/8	.875
48	.....	.....	.....	.....	.....	.075	.076	....	.690	48	57/64	.89063
49	.....	.....	.....	.....	.....	.072	.073	....	.703	49	29/32	.90625
50	.....	.....	.....	.....	.....	.069	.070	....	.716	50	59/64	.92188

Letter Sizes Stubbs Steel Wire

A	.234	I	.272	R	.339
B	.238	J	.277	S	.348
C	.242	K	.281	T	.358
D	.246	L	.290	U	.368
E	.250	M	.295	V	.377
F	.257	N	.302	W	.386
G	.261	O	.316	X	.397
H	.266	P	.323	Y	.404
		Q	.332	Z	.413

Index to Tables and Data appears on Pages 777 and 778.

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Sizes of Numbers of the United States Standard Gauge for Sheet and Plate Iron and Steel

An Act Establishing a Standard Gauge for Sheet and Plate Iron and Steel

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled: That for the purpose of securing uniformity the following is established as the only gauge for sheet and plate iron and steel in the United States of America, namely:

Number of Gauge	Approximate Thickness in Fractions of an Inch	Approximate Thickness in Decimal Parts of an Inch	Weight per Square Foot in Ounces Avoirdupois	Weight per Square Foot in Pounds Avoirdupois
0000000	1/2	.5	320	20.00
000000	15/32	.46875	300	18.75
00000	7/16	.4375	280	17.50
0000	13/32	.40625	260	16.25
000	3/8	.375	240	15.00
00	11/32	.34375	220	13.75
0	5/16	.3125	200	12.50
1	9/32	.28125	180	11.25
2	17/64	.265625	170	10.625
3	1/4	.25	160	10.00
4	15/64	.234375	150	9.375
5	7/32	.21875	140	8.75
6	13/64	.203125	130	8.125
7	3/16	.1875	120	7.5
8	11/64	.171875	110	6.875
9	5/32	.15625	100	6.25
10	9/64	.140625	90	5.625
11	1/8	.125	80	5.00
12	7/64	.109375	70	4.375
13	3/32	.09375	60	3.75
14	5/64	.078125	50	3.125
15	9/128	.0703125	45	2.8125
16	1/16	.0625	40	2.5
17	9/160	.05625	36	2.25
18	1/20	.05	32	2.
19	7/160	.04375	28	1.75
20	3/80	.0375	24	1.50
21	11/320	.034375	22	1.375
22	1/32	.03125	20	1.25
23	9/320	.028125	18	1.25
24	1/40	.025	16	1.
25	7/320	.021875	14	.875
26	3/160	.01875	12	.75
27	11/640	.0171875	11	.6875
28	1/64	.015625	10	.625
29	9/640	.0140625	9	.5625
30	1/80	.0125	8	.5
31	7/640	.0109375	7	.4375
32	13/1280	.01015625	6½	.40625
33	3/320	.009375	6	.375
34	11/1280	.00859375	5½	.34375
35	5/640	.0078125	5	.3125
36	9/1280	.00703125	4½	.28125
37	17/2560	.006640625	4¼	.265625
38	1/160	.00625	4	.25

And on and after July first, eighteen hundred and ninety-three, the same and no other shall be used in determining duties and taxes levied by the United States of America on sheet and plate iron and steel. But this act shall not be construed to increase duties upon any articles which may be imported.

Sec. 3.—That in the practical use and application of the standard gauge hereby established a variation of two and one-half per cent. either way may be allowed.

Approved March 3, 1893.

Index to Tables and Data appears on Pages 777 and 778.

WEIGHT OF STEEL PER LINEAR FOOT

FLAT SIZES

	½	⅝	¾	⅞	1	1⅛	1¼	1⅜	1½	1¾	2	2¼	2½	2¾	3	3½	4	5	6	7
⅛	.213	.266	.320	.372	.426	.479	.530	.585	.640	.745	.850	.955	1.07	1.18	1.28	1.49	1.70	2.13	2.56	2.98
3/16	.319	.399	.480	.558	.639	.718	.790	.878	.960	1.12	1.28	1.43	1.60	1.76	1.92	2.24	2.55	3.20	3.83	4.47
¼	.425	.533	.640	.743	.852	.958	1.06	1.17	1.28	1.49	1.70	1.91	2.13	2.34	2.56	2.98	3.40	4.26	5.11	5.96
5/16	.531	.665	.800	.929	1.06	1.20	1.33	1.46	1.60	1.86	2.13	2.39	2.66	2.92	3.19	3.72	4.25	5.32	6.38	7.44
⅜	.638	.798	.960	1.12	1.28	1.43	1.59	1.75	1.91	2.23	2.55	2.87	3.20	3.51	3.83	4.46	5.10	6.40	7.66	8.92
7/16	.744	.931	1.12	1.30	1.49	1.67	1.86	2.05	2.23	2.60	2.98	3.35	3.72	4.09	4.46	5.21	5.95	7.44	8.92	10.40
½	.....	1.07	1.28	1.49	1.70	1.91	2.13	2.34	2.55	2.98	3.40	3.83	4.26	4.68	5.10	5.96	6.80	8.52	10.20	11.90
9/16	.....	1.20	1.44	1.67	1.91	2.15	2.39	2.63	2.87	3.35	3.83	4.30	4.78	5.26	5.74	6.69	7.65	9.56	11.50	13.40
⅝	.....	.....	1.60	1.86	2.12	2.39	2.66	2.92	3.19	3.72	4.26	4.79	5.32	5.86	6.39	7.44	8.52	10.64	12.78	14.90
11/16	.....	.....	1.76	2.04	2.34	2.63	2.92	3.22	3.51	4.09	4.68	5.26	5.84	6.43	7.01	8.18	9.35	11.70	14.00	16.40
¾	.....	.....	.....	2.23	2.55	2.86	3.19	3.50	3.83	4.46	5.10	5.74	6.40	7.02	7.65	8.92	10.20	12.80	15.30	17.90
13/16	.....	.....	.....	2.41	2.76	3.11	3.45	3.80	4.14	4.83	5.53	6.22	6.91	7.60	8.29	9.67	11.10	13.80	16.60	19.30
⅞	.....	.....	.....	.....	2.98	3.34	3.72	4.09	4.46	5.21	5.96	6.70	7.46	8.19	8.94	10.42	11.92	14.87	17.88	20.80
15/16	.....	.....	.....	.....	3.19	3.59	3.98	4.38	4.78	5.58	6.38	7.17	7.97	8.77	9.56	11.20	12.80	15.90	19.10	22.40
1	.....	.....	.....	.....	.....	3.82	4.25	4.68	5.10	5.96	6.80	7.66	8.52	9.36	10.20	11.92	13.60	17.04	20.40	23.80
1⅛	.....	.....	.....	.....	.....	.....	4.78	5.27	5.74	6.71	7.65	8.61	9.59	10.54	11.48	13.41	15.30	19.17	22.95	26.80
1¼	.....	.....	.....	.....	.....	.....	.....	5.85	6.38	7.45	8.50	9.57	10.65	11.71	12.76	14.90	17.00	21.30	25.61	29.76
1½	.....	.....	.....	.....	.....	.....	.....	7.02	7.67	8.94	10.20	11.49	12.78	14.04	15.30	17.88	20.40	25.56	30.60	35.70

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Weight in Pounds of Sheet and Bar Aluminun, Brass and Steel

Thickness or Diam. in Inch		Sheets per Square Foot			Square Bars, One Foot Long			Round Bars, One Foot Long		
Fraction	Dec.	Alum.	Brass	Steel	Alum.	Brass	Steel	Alum.	Brass	Steel
1/16	.0625	.869	2.77	2.52	.004	.014	.013	.003	.011	.010
1/8	.125	1.739	5.55	5.10	.018	.057	.053	.014	.047	.042
3/16	.1875	2.609	8.32	7.65	.041	.131	.119	.032	.102	.094
1/4	.2500	3.479	11.10	10.20	.072	.230	.212	.057	.182	.167
5/16	.3125	4.348	13.87	12.75	.114	.380	.333	.089	.284	.261
3/8	.3750	5.218	16.64	15.30	.163	.520	.478	.128	.408	.375
7/16	.4375	6.088	19.42	17.85	.222	.708	.651	.174	.555	.511
1/2	.5000	6.958	22.20	20.40	.290	.925	.850	.227	.724	.667
9/16	.5625	7.827	24.97	22.95	.367	1.171	1.076	.288	.919	.845
5/8	.6250	8.697	27.74	25.50	.453	1.445	1.328	.356	1.136	1.043
11/16	.6875	9.567	30.52	28.05	.548	1.748	1.608	.430	1.372	1.262
3/4	.7500	10.436	33.29	30.60	.652	2.080	1.913	.516	1.646	1.502
13/16	.8125	11.306	36.07	33.15	.766	2.445	2.245	.601	1.917	1.763
7/8	.8750	12.175	38.84	35.70	.888	2.833	2.603	.697	2.223	2.044
15/16	.9375	13.045	41.61	38.25	1.019	3.251	2.989	.800	2.552	2.347
1	1.0000	13.915	44.39	40.80	1.159	3.697	3.400	.911	2.906	2.670
1 1/16	1.0625	14.784	47.16	43.35	1.309	4.176	3.838	1.028	3.279	3.014
1 1/8	1.125	15.654	49.94	45.90	1.467	4.630	4.303	1.152	3.675	3.379
1 3/16	1.1875	16.524	52.71	48.45	1.635	5.216	4.795	1.284	4.096	3.766
1 1/4	1.2500	17.394	55.48	51.00	1.812	5.780	5.312	1.423	4.539	4.173
1 5/16	1.3125	18.263	58.26	53.55	1.997	6.370	5.857	1.569	5.003	4.600
1 3/8	1.3750	19.133	61.04	56.10	2.192	6.692	6.428	1.722	5.491	5.049
1 7/16	1.4375	20.002	63.81	58.65	2.396	7.644	7.026	1.882	6.002	5.518
1 1/2	1.5000	20.872	66.58	61.20	2.609	8.322	7.650	2.049	6.536	6.008
1 9/16	1.5625	21.741	69.35	63.75	2.831	9.030	8.301	2.223	7.091	6.520
1 5/8	1.6250	22.611	72.13	66.30	3.062	9.768	8.978	2.405	7.672	7.051
1 11/16	1.6875	23.481	74.90	68.85	3.302	10.53	9.682	2.593	8.271	7.604
1 3/4	1.7500	24.350	77.67	71.40	3.550	11.32	10.41	2.789	8.896	8.178
1 13/16	1.8125	25.250	80.54	73.95	3.810	12.15	11.17	2.992	9.544	8.773
1 7/8	1.8750	26.090	83.22	76.50	4.075	13.00	11.95	3.202	10.21	9.388
1 15/16	1.9375	26.960	86.00	79.05	4.352	13.88	12.76	3.417	10.90	10.02
2	2.0000	27.829	88.77	81.60	4.638	14.79	13.60	3.642	11.62	10.68

Weight of Aluminum, Iron, Copper, Brass and Lead Balls

Dia. In.	Alum., Lbs.	Iron, Lbs.	Copper, Lbs.	Brass, Lbs.	Lead, Lbs.	Dia., In.	Alum. Lbs.	Iron, Lbs.	Copper Lbs.	Brass, Lbs.	Lead, Lbs.
1	.045	.136	.166	.158	.214	7	15.58	46.76	57.1	54.5	73.7
1½	.153	.46	.562	.537	.727	7½	19.17	57.52	70.0	67.11	90.0
2	.363	1.09	1.3	1.25	1.7	8	23.27	69.81	85.2	81.4	110.1
2½	.710	2.13	2.60	2.50	3.35	8½	27.91	83.73	102.3	100.0	132.3
3	1.22	3.68	4.5	4.3	5.8	9	33.10	99.4	121.3	115.9	156.7
3½	1.94	5.84	7.14	6.82	9.23	9½	38.90	116.9	143.0	136.4	184.7
4	2.90	8.72	10.7	10.2	13.8	10	45.45	136.35	166.4	159.0	215.0
4½	3.13	12.42	15.25	14.5	19.6	10½	52.60	157.84	193.0	184.0	250.0
5	5.68	17.04	20.8	19.9	26.9	11	60.49	181.48	221.8	211.8	286.7
5½	7.56	22.68	27.74	26.47	36.0	11½	69.12	207.37	253.5	242.0	327.7
6	9.81	29.45	35.9	34.3	46.4	12	78.54	235.62	288.1	275.0	372.8
6½	12.48	37.44	45.76	43.67	59.13						

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International (Metric System) Standard 60° Thread

Diameter of Screw	Pitch	Diameter at Root of Thread	Width of Flat at Top and Bottom of Thread
Millimetres	*Millimetres*	*Millimetres*	*Millimetres*
3	.5	2.35	.06
4	.75	3.03	.09
5	.75	4.03	.09
6	1.0	4.70	.13
7	1.0	5.70	.13
8	1.0	6.70	.13
8	1.25	6.38	.16
9	1.0	7.70	.13
9	1.25	7.38	.16
10	1.5	8.05	.19
11	1.5	9.05	.19
12	1.5	10.05	.19
12	1.75	9.73	.22
14	2.0	11.40	.25
16	2.0	13.40	.25
18	2.5	14.75	.31
20	2.5	16.75	.31
22	2.5	18.75	.31
22	3.0	18.10	.38
24	3.0	20.10	.38
26	3.0	22.10	.38
27	3.0	23.10	.38
28	3.0	24.10	.38
30	3.5	25.45	.44
32	3.5	27.45	.44
33	3.5	28.45	.44
34	3.5	29.45	.44
36	4.0	30.80	.5
38	4.0	32.80	.5
39	4.0	33.80	.5
40	4.0	34.80	.5
42	4.5	36.15	.56
44	4.5	38.15	.56
45	4.5	39.15	.56
46	4.5	40.15	.56
48	5.0	41.51	.63
50	5.0	43.51	.63
52	5.0	45.51	.63

NOTE.—This thread is largely used by Italian constructors.

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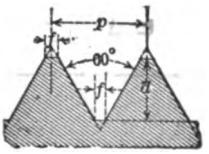
UNITED STATES 60° SCREW THREAD



Formula
$$\begin{cases} p = \text{pitch} = \dfrac{1}{\text{No. threads per inch}} \\ d = \text{depth} = p \times .6495 \\ f = \text{flat} = \dfrac{p}{8} \end{cases}$$

Diameter of Screw	Threads to Inch	Diameter at Root of Thread	Width of Flat
¼	20	.185	.0063
5/16	18	.2403	.0069
⅜	16	.2936	.0078
7/16	14	.3447	.0089
½	13	.4001	.0096
9/16	12	.4542	.0104
⅝	11	.5069	.0114
¾	10	.6201	.0125
⅞	9	.7307	.0139
1	8	.8376	.0156
1⅛	7	.9394	.0179
1¼	7	1.0644	.0179
1⅜	6	1.1585	.0208
1½	6	1.2835	.0208
1⅝	5½	1.3888	.0227
1¾	5	1.4902	.0250
1⅞	5	1.6152	.0250
2	4½	1.7113	.0278
2¼	4½	1.9613	.0278
2½	4	2.1752	.0313
2¾	4	2.4252	.0313
3	3½	2.6288	.0357
3¼	3½	2.8788	.0357
3½	3¼	3.1003	.0385
3¾	3	3.3170	.0417
4	3	3.5670	.0418
4¼	2¾	3.7982	.0455
4½	2¾	4.0276	.0455
4¾	2½	4.2551	.0476
5	2½	4.4804	.0500
5¼	2½	4.7304	.0500
5½	2¼	4.9530	.0526
5¾	2¼	5.2030	.0526
6	2¼	5.4226	.0556

Standard Proportions for Machine Screws

The report of the committee on standard proportions for machine screws of the American Society of Mechanical Engineers is published in the October, 1906, proceedings of the society. The report is substantially in agreement with the recommendations adopted at the joint meeting held in New York, April 11, 1904.

The committee believes the following combined details to be essential in establishing and maintaining a standard for the diameters, threads and heads of machine screws, including, as it does, diameters, threads and limits for the taps which are to be used in connection therewith: (*a*) form of thread, (*b*) diameters, (*c*) number of threads per inch, (*d*) standard reference thread gauges, basic and for screws and taps, (*e*) working gauges for screws and taps, (*f*) limits of variation, measured in the angle of the thread, (*g*) limits of variation in external diameter, (*h*) limits of variation in the pitch of the thread screws and taps, (*k*) proportions of the heads.

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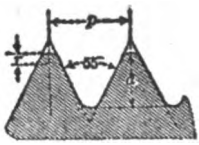
Whitworth Standard Thread



Formula
$$p = \text{pitch} = \frac{1}{\text{No. threads per inch}}$$
$$d = \text{depth} = p \times .64033$$
$$r = \text{radius} = p \times .1373$$

Full Diameter	No. of Threads per Inch	Pitch	Standard Depth of Thread	Effective Diameter	Core Diameter	Cross Sectional Area at Bottom of Thread
1/4 (.25)	20	.0500	.0320	.2180	.1860	.0272
5/16 (.3125)	18	.0556	.0356	.2769	.2414	.0458
3/8 (.375)	16	.0625	.0400	.3350	.2950	.0683
7/16 (.4375)	14	.0714	.0457	.3918	.3460	.0940
1/2 (.5)	12	.0833	.0534	.4466	.3933	.1215
9/16 (.5625)	12	.0833	.0534	.5091	.4558	.1632
5/8 (.625)	11	.0909	.0582	.5668	.5086	.2032
11/16 (.6875)	11	.0909	.0582	.6293	.5711	.2562
3/4 (.75)	10	.1000	.0640	.6860	.6219	.3038
13/16 (.8125)	10	.1000	.0640	.7485	.6844	.3679
7/8 (.875)	9	.1111	.0711	.8039	.7327	.4216
1	8	.1250	.0800	.9200	.8399	.5540
1 1/8 (1.125)	7	.1429	.0915	1.0335	.9420	.6969
1 1/4 (1.25)	7	.1429	.0915	1.1585	1.0670	.8942
1 3/8 (1.375)	6	.1667	.1067	1.2683	1.1616	1.0597
1 1/2 (1.5)	6	.1667	.1067	1.3933	1.2866	1.3001
1 5/8 (1.625)	5	.2000	.1281	1.4969	1.3689	1.4718
1 3/4 (1.75)	5	.2000	.1281	1.6219	1.4939	1.7528
2	4 1/2	.2222	.1423	1.8577	1.7154	2.3111
2 1/4 (2.25)	4	.2500	.1601	2.0899	1.9298	2.9249
2 1/2 (2.5)	4	.2500	.1601	2.3399	2.1798	3.7318
2 3/4 (2.75)	3 1/2	.2857	.1830	2.5670	2.3841	4.4641
3	3 1/2	.2857	.1830	2.8170	2.6341	5.4496
3 1/4 (3.25)	3 1/4	.3077	.1970	3.0530	2.8560	6.4063
3 1/2 (3.50)	3 1/4	.3077	.1970	3.3030	3.1060	7.5769
3 3/4 (3.75)	3	.3333	.2134	3.5366	3.231	8.6732
4	3	.3333	2134	3.7866	3.5731	10.0272
4 1/2 (4.50)	2 7/8	.3478	.2227	4.2773	4.0546	12.9118
5	2 3/4	.3636	.2328	4.7672	4.5343	16.1477
5 1/2 (5.50)	2 5/8	.3810	.2439	5.2561	5.0121	19.7301
6	2 1/2	.4000	.2561	5.7439	5.4877	23.6521

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Drill Sizes for Standard Threads

These sizes give an allowance above the bottom of thread on sizes ¼ to 2; varying respectively as follows: for "V" Threads, .010″ to .055″; for U. S. S. and Whitworth threads .005″ to .027″.

These are found by adding to the size at bottom of thread ¼ of the pitch for "V" threads, and ⅛ of the pitch for U. S. S. and Whitworth, the pitch being equal to 1″ ÷ No. of threads per 1″.

In practice it is better to use a larger drill if the exact size called for cannot be had.

Size Screw	No. of Threads	Size of Drill			Size Screw	No. of Threads	Size of Drill		
		U. S. S.	"V"	W.			U. S. S.	"V"	W.
¼	24	.201	.196	.202	15/16	9	.808	.790	.810
¼	20	.191	.184	.192	1	8	.854	.832	.856
5/16	18	.248	.239	.249	1 1/16	8	.917	.894	.919
⅜	16	.302	.293	.303	1⅛	7	.957	.932	.960
7/16	14	.354	.345	.355	1¼	7	1.082	1.057	1.085
½	13	.409	.399	.410	1⅜	6	1.179	1.144	1.182
½	12	.402	.391	.403	1½	6	1.304	1.269	1.307
9/16	12	.465	.453	.466	1⅝	5½	1.412	1.372	1.416
⅝	11	.518	.506	.520	1⅝	5	1.390	1.347	1.394
11/16	11	.581	.568	.583	1¾	5	1.515	1.472	1.519
¾	10	.632	.618	.634	1⅞	5	1.640	1.597	1.644
13/16	10	.695	.680	.697	1⅞	4½	1.614	1.566	1.619
⅞	9	.745	.728	.747	2	4½	1.739	1.691	1.744

Drill Sizes for S. A. E. Threads

Size of Tap	Size of Drill
¼ inch x 28 threads	7/32 inch
5/16 " x 24 "	17/64 "
⅜ " x 24 "	21/64 "
7/16 " x 20 "	⅜ "
½ " x 20 "	7/16 "
9/16 " x 18 "	½ "
⅝ " x 18 "	9/16 "
11/16 " x 16 "	39/64 "
¾ " x 16 "	43/64 "
⅞ " x 14 "	25/32 "
1 " x 14 "	29/32 "
1 ⅛ " x 12 "	1 1/64 "
1 ¼ " x 12 "	1 9/64 "
1 ⅜ " x 12 "	1 17/64 "
1 ½ " x 12 "	1 25/64 "

The above tap drills allow a thread within 1-64 in. of full thread.

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Air and Wind Pressure

On this subject reliable data are yet to be formulated and established.

When an object is moved in the atmosphere or a current of air strikes an object, a pressure is produced, but the natural laws governing the force and nature of the pressure are as yet understood only in part. Investigations conducted in connection with the development of dirigible balloons and airplanes have established a few isolated data with regard to suitable shapes for objects intended to be moved in the atmosphere with a minimum of resistance. Efforts to improve the automatic balancing of airplanes have at the same time resulted in a few hints relating to shapes causing unusually pronounced resistance in the air. The mobility and elasticity of air complicate the subject and render the application of the known kinetic laws extraordinarily difficult. At one point the recent investigations have been decisive, however; namely, in disclosing that previously accepted ideas were faulty and misleading.

Features in which automobile design is affected by the greater or lesser knowledge at disposal with reference to pressures and movements of the atmosphere are as follows:

Shapes of vehicles (front, rear, top, bottom and wheels) producing a minimum of air resistance for fast driving or driving against a high wind.

The position and area of windshields and headlights.

The air channels in radiators.

The regulation of air passage under the hood, especially at the carbureter intakes.

Design and timing of intake and exhaust valves.

The ventilating fan and its position.

The carbureter and manifold channels.

The exhaust pipe and the muffler, where sounds as well as resistances are affected.

Provisions for reducing the dust nuisance through vehicle design causing least atmospheric disturbance and eddies along the road surface.

Provisions for making road grit and dust strike the vehicle body and its occupants in as small a measure as possible.

The design of dynamometers intended to measure power by air resistance against the movement of rotated blades.

At all these points the designer's understanding of the air pressures and movements involved is following far behind actual construction based on experience, or is deliberately subordinated, as being unsafe, to conventional design.

According to previously accepted ideas, which were applied in practice mainly to figure maximum wind pressure upon buildings and bridges, the pressure in pounds, P, against a squarely apposed plane area, S, square feet, at a wind velocity of V, miles per hour, was expressed in the formula: $P = 0.0025\ AV^2$, various investigators having gradually reduced the numerical factor from 0.005, which was first supposed to be correct, to one-half of this value.

Among recent writers on the subject, Frederick Strickland (London) says: "Different experimenters have found resistance of flat surface varying from $P = 0.0025\ SV^2$ *to* $P = 0.0053\ V^2$. Practice supports lower figure for conditions resembling propulsion of a motor car." In figuring the horsepower required for overcoming air resistance, Strickland argues that the power increases as the cube of the speed when the air resistance increases as the square of the speed and establishes curves showing the power consumed, on this theory, to overcome the air resistance of a car having an effective area of 12 square feet, "corresponding somewhat to that of a town car designed with aim for streamline effect." The theory that the required power increases more rapidly than the resistance which it overcomes is not widely accepted, but the presentation of it serves to point out the uncertainty existing with regard to the facts.

According to a more generally shared view, the basic formula for the resistance is in itself faulty, V^2 being too low for high speeds and V^3 nearer the truth.

In applying this formula to irregular shapes or to plane surfaces held at an angle smaller than 90 deg. to the direction of movement and air resistance, it has been customary to assume that the effective area S is the horizontal projection of the actual area. For example, it has been supposed that a windshield held at an angle of 60 deg. is equivalent, so far as air resistance is concerned, to one standing vertically and reaching to the same height. Its area would be 0.87 of that of the sloping shield, but the reduction of air resistance is much more than 13 per cent.

The principal flaw, both in the basic formula and in the projected-area theory, lies in disregarding body shapes and dimensions and assuming that frontal area alone determines air and wind resistance. If the question is one of wind resistance to a motor car, the direction of the wind is an additional factor that baffles calculation and renders any application of previously accepted theories useless.

More modern views originate from experiments with streamline shapes to determine the best shapes for boats. A square or oblong piece of soap that is dragged through water by a string passing through the soap assumes gradually by the wear due to resistance of the water the shape now characterized as "streamline," which is an oval, more elongated and

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more pointed at the rear the faster the dragging movement has been. This agreed with the requirement of considerable length for fast boats. In airplane experiments it was similarly found that the adoption of streamline sections for construction parts reduced air resistance and the formation of eddies. Air being much lighter and more elastic than water, and having a mobility of a different character, the streamline shapes for aircraft were not in all respects identical with those for boats, but the main principle found to be fully established in both cases was the same, to the effect that the resistance encountered by moving an object against water or air cannot be determined from the areas opposed to the movement and the speed, but undergoes radical changes if the shapes or dimensions of the object are altered without altering the frontal area. And it has been further established that different speeds call for different shapes if the minimum of resistance for a given frontal area shall be realized. As both the previously accepted theories conflict with these results, they are thereby superseded, the formula $P = 0.0025\,SV^2$ remaining applicable only for such as determining maximum wind pressure upon a grandstand bulletin board or similar thin and isolated structure; and then only if the formula is confirmed by experience, as there is no real warrant for figuring the kinetic energy of moving air by squaring its velocity, since the compressibility and elasticity of air destroy all analogy with water or solids.

According to measurements by the United States Signal Service at Mount Washington, N. H., the wind pressure against a vertical plane with nothing behind it is as follows, in pounds per square foot:

Miles Per Hour	Pressure	Miles Per Hour	Pressure
10	0.4	50	10.0
20	1.6	60	14.4
30	3.6	80	25.6
40	6.4	100	40.0

and upon a cylindrical surface the pressure is one-half of these figures for the same frontal area, but this is subject to variation according to whether there is a cylindrical, a flat or a hollow surface at the back of the cylindrical surface turned against the wind.

Hill Climbing Formulas

Contests for ascertaining the different capacities of different cars for ascending long and steep hills at a maximum of speed are no longer of interest as a means for determining what power, weight and gear proportions should be incorporated in a motor vehicle or for spreading information among the public with regard to car requirements or car merits By reason of the increased power and reliability of modern engines, the result of an ordinary hill-climbing contest is now dominated by the proportion between power and weight. Long and steep hills can be ascended by almost any motor vehicle at a rate of speed which is higher than desirable, considering the wear and tear of tires. The importance of certain relations between gear speed ratio and the useful range of engine speed, which was very pronounced in the days of small and uncertain engine power, is much reduced, yet these relations are still decisive for getting the best hill-climbing ability from a given proportion of power and weight.

The influence of gear ratio and useful engine speed has not so far been expressed in a formula, however, while old so-called hill-climbing formulas have been discarded as worthless for practical purposes, their place being taken largely by rules for car performance tests, as formulated or projected by the Society of Automotive Engineers (S. A. E. Bulletin, May, 1917, p. 141 to 155) and similar organizations in foreign countries.

If a car has four gear speeds proportioned as 1, 1.6, 2.6 and 4.2 and the useful engine speed ranges from 1200 to 1800 revolutions per minute, the vehicle speed on one of the gears at 1200 r.p.m. remains a little higher than it can be at 1800 r.p.m. on the next lower gear, which is 1.6 times slower, as $1200 \times 1.6 = 1920$. Such a car can drop to the next lower gear on any hill without losing much speed. If the ratio from gear to gear is 1.5, all the loss will be that due to the time required for acceleration and the lesser efficiency of the lower gear. With a ratio of 1.4, making the progression 1, 1.4, 1.96 and 2.75, these factors would be taken care of, and any hill could be ascended at the top speed possible with the power available.

Supposing the car has only three gearspeeds, 1, 2.4 and 5.76, the intermediate ratio being 2.4, then a grade of the hill rendering a lower gear necessary results in a loss of vehicle speed, as the engine speed can be raised only from 1200 to 1800, in the proportion of 1.5 to 1, while the gearspeed drops as from 2.4 to 1. With such a gear equipment the hill-climbing ability therefore depends on the grades of the hill. In competition with a car of equal power and weight having a 1.6 second gear, it will lose, if the hill is such as to make the 1.6 gear sufficiently powerful, but it will win if the grade is steep enough to compel the use of the 2.6 gear on the other car.

(*Continued on following page*)

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Hill-climbing contests are therefore either a gamble on the suitability of certain gear ratios for certain hills, or else demonstrations of the self-evident fact that the principal requirement is high power per weight unit.

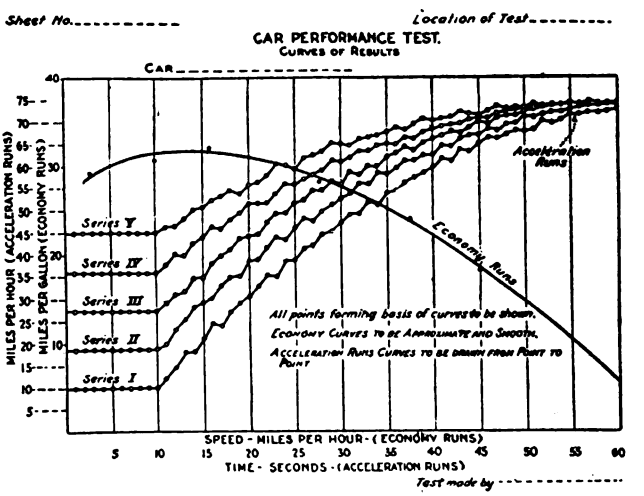
The torque curve of the engine would be a factor of more than minor importance if it were not considered beforehand in determining the "useful range of engine speed".

Hill-climbing tests are now resorted to mainly for determining the properties of one fuel in comparison with those of another fuel, the contesting cars being alike; or one carbureter against another; one kind of tires against another.

Complete Car Performance Tests

Tests relating to all the principal operative properties of a car are recommended by the Research Division of the Society of Automotive Engineers. The complete test includes a series of runs at various specified speeds from the minimum to the maximum speed of the car in order to determine fuel consumption and five series of acceleration runs, starting at various specified speeds from the minimum speed of the car on high gear to about 30 miles per hour. In each run the acceleration period allowed is 50 seconds.

To produce uniform conditions as a basis for comparisons, the recommendations include description and illustrations of the apparatus used, and detailed directions for conducting the runs, weighing the fuel, measuring the acceleration, and computing and recording the results. Forms also are provided for recording the specifications of the car and other pertinent data, for recording the observations and for plotting the results.



For the fuel economy runs, the amount of fuel used is determined by weighing in special tanks, and the distance covered is regulated by using measured courses of prescribing length and character. For the acceleration runs a recording instrument has been designed to produce on a continuous strip of moving paper parallel records of seconds and of distance. The seconds record is obtained from an electric chronometer, and the distance record by an electric spark puncturing the paper once for each one-fifth of a revolution of a front wheel of the car.

The results of the whole test are plotted on one chart in the form of curves as roughly indicated in the sketch herewith.

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Brakes and Clutches

Designs for brakes and clutches for motor vehicles have been developed empirically, and the development of brakes continues to be carried on without close reference to the mathematical formulas for retardation of a moving mass. The maintenance of constant conditions in the braking organs, especially a constant co-efficient of friction, and the suitable disposal of the heat generated by braking efforts, especially on long declivities, constitute the points on which difficulties are still mostly experienced. In European motor trucks, friction brakes are usually designed with metal to metal contact, this giving harsh action but improved (though not yet sufficient) heat convection. In American-built vehicles, the friction surfaces are usually metal and fabric, and the properties of the latter under all actual conditions of vehicle operation are the most important factor, assuming that conventional types and dimensions are employed.

Conclusive data on brake and clutch facings have not as yet been compiled or received the sanction of authorities.

Formulas for Cone Clutches (*C. A. Schaefer*)

H.P. = horse-power transmitted.

N = revolutions of crank-shaft per minute.

r = mean radius of friction cone, in inches.

r_1 = large radius of friction cone, in inches.

r_2 = small radius of friction cone, in inches.

R_1 = outside radius of leather band, in inches.

R_2 = inside radius of leather band, in inches.

v = velocity of a point at distance r from the center, in feet per minute.

F = tangential force acting at radius r, in pounds.

Pn = total normal pressure between cone surfaces, in pounds.

Ps = spring pressure, in pounds.

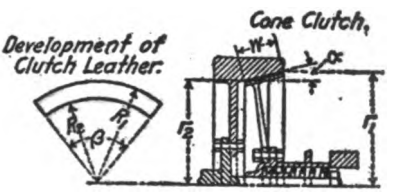
α = angle of clutch surface with axis of shaft = 7 to 13 degrees.

β = included angle of clutch leather, when developed, in degrees.

f = coefficient of friction = 0.20 to 0.25 for greasy leather on iron.

p = allowable pressure per square inch of leather band = 1 to 8 pounds.

W = width of clutch leather, in inches.



$$R_1 = \frac{r_1}{\sin \alpha} \qquad \text{H.P.} = \frac{Pn\, f\, r\, N}{63025}$$

$$R_2 = \frac{r_2}{\sin \alpha}$$

Engagement with some slip:

$$\beta = \sin \alpha \times 360 \qquad Pn = \frac{Ps}{\sin \alpha}$$

$$r = \frac{r_1 \times r_2}{2} \qquad Ps = \frac{\text{H.P.} \times 63025 \sin \alpha}{f\, r\, N}$$

$$v = \frac{2\pi r N}{12}$$

Engagement without slip:

$$F = \frac{\text{H.P.} \times 33000}{v} \qquad Pn = \frac{Ps}{\sin \alpha + f \cos \alpha}$$

$$W = \frac{Pn}{2\pi r p}$$

$$Ps = \frac{\text{H.P.} \times 63025\ (\sin \alpha + f \cos \alpha)}{f\, r\, N}$$

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Multiple Disc Clutches

While multiple disk clutches are designed and dimensioned mainly under the guidance of experience, acceleration formulas are used for checking the designs in each case.

A formula for clutch capacity which is employed for this purpose is the following:

$$Hp. = \frac{PfSRN}{63.025}$$

in which P is spring pressure, f co-efficient of friction, S number of friction surfaces, R mean radius of friction ring in inches and N maximum revolutions per minute of crankshaft.

It is found that this formula agrees well with experience if the value for f is taken as 12 to 15 per cent for asbestos woven clutch facings.

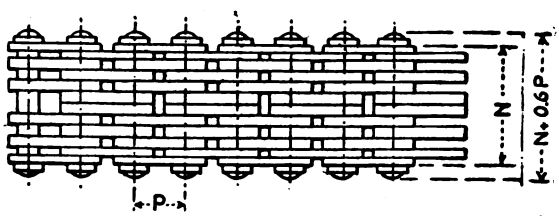
The torque which can be applied through a multiple disk clutch with V-grooves in the disks is determined by the formula:

$$T \text{ (in pounds-inches)} = rPf\,(N\text{-}1)C$$

in which r is the radius in inches of the V-groove, P the spring pressure, f equals 0.1 co-efficient of friction, N is the total number of disks and C a constant, which is 3.5 for automobile clutches and 2.5 for aeroplane clutches. The former have V-grooves of a 35-deg. angle, the latter of 45-deg. angle.

Widths of Silent Chains

According to recommended practice, the standard width of a silent chain is the width over all tension members and the maximum width of chain over rivet heads is this nominal width plus six-tenths the pitch. The table shows the extreme widths for the various pitches. Width of sprocket for the same nominal width of chain will vary according to the method of guiding the chain.



Chain Width No.	(N) Width Over Tension Members	Extreme Width of Chain (N+0.6P)							
		⅜-In. Pitch	½-In. Pitch	⅝-In. Pitch	¾-In. Pitch	1-In. Pitch	1¼-In. Pitch	1½-In. Pitch	2-In. Pitch
4	½	0.725	0.800	0.875	.....	.....	.....	.....	.....
6	¾	0.975	1.050	1.125	1.200	.....	.....	.....	.....
8	1	1.225	1.300	1.375	1.450	1.600	.....	.....	.....
10	1¼	1.475	1.550	1.625	1.700	1.850	2.000	.....	.....
12	1½	1.725	1.800	1.875	1.950	2.100	2.250	2.400	.....
14	1¾	1.975	2.050	2.125	2.200	2.350	2.500	2.650	.....
16	2	2.225	2.300	2.375	2.450	2.600	2.750	2.900	3.200
18	2¼	2.475	2.550	2.625	2.700	2.850	3.000	3.150	3.450
20	2½	2.725	2.800	2.875	2.950	3.100	3.250	3.400	3.700
24	3	3.225	3.300	3.375	3.450	3.600	3.750	3.900	4.200
28	3½	.....	3.800	3.875	3.950	4.100	4.250	4.400	4.700
32	4	.....	4.300	4.375	4.450	4.600	4.750	4.900	5.200
40	5	.....	.....	5.375	5.450	5.600	5.750	5.900	6.200
48	6	.....	.....	6.375	6.450	6.600	6.750	6.900	7.200

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Marketed Production of Crude Petroleum for Years 1910-1916 in Barrels of 42 Gallons

	Roumania	U. S. A.	Russia	Dutch E. Ind.	Mexico	Total
1910.....	9,723,806	209,557,248	70,336,574	11,030,620	3,332,807	327,615,603
1911.....	11,107,450	220,449,391	66,183,691	12,172,949	14,051,643	345,685,081
1912.....	12,976,232	222,935,044	68,019,208	10,845,624	16,558,215	352,484,591
1913.....	13,554,768	248,446,230	62,834,356	11,966,857	25,902,439	384,667,550
1914.....	12,826,579	265,762,535	67,020,522	12,705,208	21,188,427	399,264.168
1915.....	13,229,913	281,104,104	68,548,062	12,386,808	32,910,508	429,119,688
1916.....	.....	292,300,000	72,360,000	.....	.....	.....

Italy, Canada, Galicia, Japan, Germany, India, Peru, Trinidad, Egypt are the principal other countries producing crude petroleum, the amounts being included in the column of Totals above.

U. S. Resources in Crude Petroleum from Wells

According to estimates by the U. S. Geological Survey the remaining supplies of crude petroleum fom United States oil regions were as follows, on Jan. 1, 1917:

Region	Per cent Exhaustion of Supply	Remaining Millions of Barrels
Appalachian.....	70	481
Lima-Indiana.....	93	31
Illinois.....	51	244
Mid-Continent.....	25	1874
North Texas.....	8	484
Northwest Louisiana.....	22	124
Gulf.....	13	1500
Colorado.....	65	6
Wyoming-Montana.....	2	540
California.....	26	2345

Total remaining millions of barrels: 7629.

From oil shale lands in Colorado and Utah much larger quantities can be produced, but at a cost as yet unknown. This reserve is estimated by the Geological Survey to be four times larger than the remaining supply of liquid petroleum from wells.

PROPERTIES OF GASES

(1*)	(2*)	(3*)	(4*)	(5*)
Hydrogen.....	H	.0692	.00559	52230
Oxygen.....	O	1.106	.08921	.....
Nitrogen.....	N	.971	.07831	.....
Carbon Monoxide.....	CO	.967	.07807	4380
Carbon Dioxide.....	CO_2	1.529	.12267	.....
Dry Air.....	.....	1 000	.08072	.....
Water Vapor.....	H_2O	.625	.05020	.....
Acetylene.....	C_2H_2	915	.07251	20673
Methane.....	CH_4	.554	.04464	21385
Ethylene.....	C_2H_4	.974	.07805	20025
Alcohol.....	C_2H_6O	1.601	.12598	12000

*1 Gases.
*2 Chemical Formula or Symbol.
*3 Density (Air = 1).
*4 Weight per cubic foot under standard conditions.
*5 Heating values per pound in B. T. U.

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Capacity of Atmospheric Air for Water Vapor at Different Temperatures

Temperature in Degrees Fahrenheit	Pounds per Cubic Feet Dry Air	Pounds of Vapor in One Pound of Air	Weight in Pounds, Cubic Feet Saturated Air	Vapor in Air	A | V
32	0.0807	0.00379	0.0802	0.000304	263.7
42	0.0791	0.00561	0.0784	0.000440	178.18
52	0.0776	0.00819	0.0766	0.000627	122.
62	0.0761	0.01179	0.0747	0.000881	85.
72	0.0747	0.01680	0.0727	0.001221	59.5
82	0.0733	0.02361	0.0706	0.001667	42.3
92	0.0720	0.03289	0.0684	0 002250	30.3
102	0.0707	0.04547	0.0659	0.002997	22.

Variation of Volume and Temperature With Compression

Gauge Pressure	Volume	Temperature
0	1.000	60
2	.910	80.4
5	.810	106
10	.690	145
20	.543	207
30	.454	252
40	.393	302
50	.350	339
75	.276	420
100	.232	485
115	.213	518
130	.197	550
145	.184	580
160	.172	607
175	.163	632
200	.149	672

The foregoing table is based on the assumption that no heat is added or subtracted.

Increasing Production of Benzol

Out of 6936 by-product coke ovens constructed at the end of the year 1916 in the United States, 5833 were equipped to recover benzol and other light oils. An output of 40,000,000 gallons of light oils is estimated for the year 1917. The output in 1915 was 16,600,657 gallons.—(C. E. Lesher of U. S. Geological Survey.)

Viscosity of Gasoline

In considering the functioning of the gasoline carbureter, changes in viscosity of the fuel due to differences in temperature should be considered. It is a mistake to assume that because gasoline does not noticeably thicken up at the lower atmospheric temperatures (usual in the Northern States in winter) it will flow through the nozzle of a carbureter at the same rate under all heat conditions. Taking gasoline of a specific gravity of 0.71, it has been shown by experiment that the amount which will pass through a nozzle of a carbureter under a given pressure will increase as the temperature is increased in the following manner:

Temperature in ° F.	50	59	68	77	86	95
Relative flow	1	1.073	1.145	1.212	1.27	1.335

Since nozzles in carbureters are not readily adjustable, and with any degree of certainty, it follows that such a great difference in the weight of fuel ejected, considering the differences in temperature named, is bound to lead to a certain amount of carbureter inefficiency of the kind which does not readily yield to treatment.

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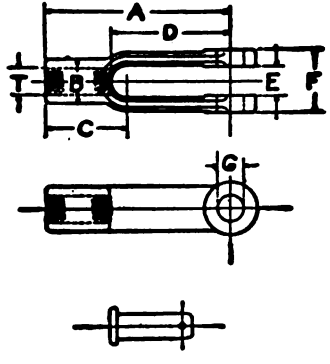
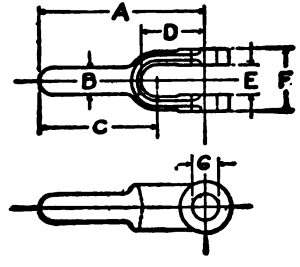
YOKE AND EYE ROD ENDS (*S. A. E. Standard*)

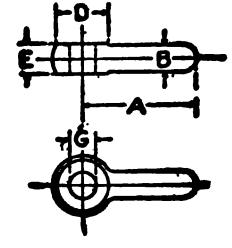
ADJUSTABLE YOKE ENDS



PLAIN YOKE ENDS



ROD ENDS



A	B	C	D	E	F	G	T
1 9/16	5/16	1 11/16	1	5/16	7/16	5/16	5/16 32 U. S.
2	7/16	7/8	1 1/4	9/32	5/8	1/4	1/4 28 A.L.A.M.
2 1/4	1/2	1	1 7/16	11/32	3/4	5/16	5/16 24 A.L.A.M.
2 1/2	5/8	1 1/8	1 5/8	7/16	7/8	3/8	5/8 24 A.L.A.M.
2 7/8	23/32	1 1/4	1 7/8	1/2	1	7/16	7/16 20 A.L.A.M.
3	13/16	1 7/16	1 7/8	9/16	1 1/8	1/2	1/2 20 A.L.A.M.

A	B	C	D	E	F	G
1 1/4	5/16	7/8	7/16	5/16	7/16	5/16
1 3/4	1/4	1 1/4	5/8	9/32	5/8	1/4
2	5/16	1 5/8	3/4	11/32	3/4	5/16
2 1/8	3/8	1 7/16	27/32	7/16	7/8	3/8
2 1/4	7/16	1 1/2	1	1/2	1	7/16
2 1/2	1/2	1 5/8	1 1/8	9/16	1 1/8	1/2

A	B	D	E	G
1 3/8	5/16	3/8	5/16	5/16
1 1/8	1/4	1/2	9/32	1/4
1 5/8	5/16	13/32	11/32	5/16
1 1/2	3/8	11/16	5/16	3/8
1 1/2	7/16	13/16	1/2	7/16
1 3/4	1/2	15/16	9/16	1/2

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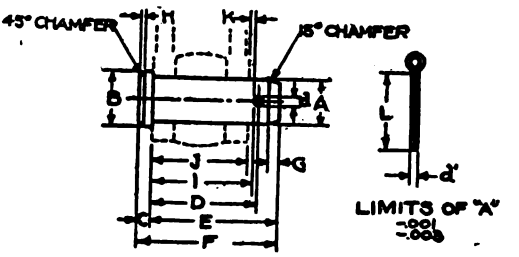
Yoke and Eye Rod End Pins (*S. A. E. Standard*)



A	B	C	D	E	F	G	H	I	S.A.E. Standard Yoke J	K	Cotter d¹	Cotter L	d — Drill No.	d — Drill Dia.	Diff. d—d¹	Diff. + k*
3/16	5/16	1/16	31/64 / .4844	19/32	21/32	3/64	1/64	.4464	7/16 / .4375	.0089	1/16 / .0625	5/16	48	.076	.0135	.0224
1/4	3/8	3/32	43/64 / .6719	51/64	57/64	1/16	1/32	.6339	5/8 / .625	.0089	1/16 / .0625	7/16	48	.076	.0135	.0224
5/16	7/16	3/32	13/16 / .8125	31/32	1 1/16	5/64	1/32	.7595	3/4 / .750	.0095	3/32 / .0937	1/2	36	.106	.0123	.0218
3/8	1/2	1/8	15/16 / .9375	1 3/32	1 7/32	5/64	1/32	.8845	7/8 / .875	.0095	3/32 / .0937	5/8	36	.106	.0123	.0218
7/16	9/16	5/32	1 1/16 / 1.0625	1 15/64	1 25/64	3/32	3/64	1.0095	1 / 1.000	.0095	3/32 / .0937	3/4	36	.106	.0123	.0218
1/2	5/8	5/32	1 13/64 / 1.2031	1 27/64	1 37/64	7/64	3/64	1.1331	1 1/8 / 1.125	.0081	1/8 / .125	7/8	28	.140	.0150	.0231

All dimensions in inches.
*Total clearance yoke to cotter

Automobile Engine Light Lubricating Oil

SPECIFICATION No. 26.

Oil for this purpose must be a pure mineral oil, no addition or adulterant of any kind being permitted.

The following characteristics are desired:

Specific gravity.....28° to 32° Baumé
Flash point, not less than.....400° F.
Fire test, not less than.....450° F.
Viscosity at 100° F., Saybolt viscosimeter, not over.....300 seconds
Viscosity at 210° F., Saybolt viscosimeter.....40 to 50 seconds
Viscosity at 210° F., Tagliabue viscosimeter.....60 to 65 seconds
Carbon residue, not over.....0.50 per cent.

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Lock Washer Dimensions (*S. A. E. Standard*)

The outside diameters of lock washers shall coincide practically with the long diameters of S. A. E. Standard nuts, which are approximately the short diameters of United States Standard nuts.

The inside diameters of the lock washers shall be from 164" to 132" larger than bolt diameters. All lock washers shall be parallel-faced sections; and bulging or malformed ends must be avoided.

Table of Sizes

Automobile Heavy (A. H.)

For General Use

Bolt Diameter	Lock Washer Section	Bolt Diameter	Lock Washer Section
3/16"	1/16"x 1/16"	11/16"	1/4"x 1/4"
1/4"	5/64"x 5/64"	3/4"	1/4" x 1/4"
5/16"	1/8" x 1/8"	7/8"	17/64"x17/64"
3/8"	1/8" x 1/8"	1"	5/16"x 5/16"
7/16"	11/64"x11/64"	1 1/8"	5/16"x 5/16"
1/2"	11/64"x11/64"	1 1/4"	3/8" x 3/8"
9/16"	13/64"x13/64"	1 3/8"	3/8" x 3/8"
5/8"	13/64"x13/64"	1 1/2"	7/16"x 7/16"

Automobile Light (A. L.)

For Optional Use Against Soft Metal

Bolt Diameter	Lock Washer Section
3/16"	1/16"x3/64"
1/4"	5/64"x1/16"
5/16"	1/8" x3/32"
3/8"	1/8" x3/32"
7/16"	11/64"x1/8"
1/2"	11/64"x1/8"
9/16"	13/64"x5/32"
5/8"	13/64"x5/32"
11/16"	1/4" x3/16"
3/4"	1/4" x3/16"
7/8"	17/64"x3/16"
	5/16"x1/4"

Test

Temper

After compression to flat, reaction shall be sufficient to indicate necessary spring power, and on a subsequent compression to flat the lock washer shall manifest no appreciable loss in reaction.

Toughness

Forty-five per cent. of the lock washer, including one end, shall be firmly secured in a vise, and forty-five per cent., including the other end, shall be secured firmly between parallel jaws of a wrench. Movement of the wrench at right angle to helical curve shall twist the lock washer through forty-five degrees without sign of fracture; and shall twist the lock washer entirely apart within one hundred and thirty-five degrees.

Oversize Cylinders (*S. A. E. Standard*)

There has hitherto existed no uniform practice as to the amount of metal removed in regrinding worn cylinders, with the result that difficulty is experienced in securing new pistons of correct size, from the manufacturers.

With a view to eliminating all unnecessary expense and delay, the following standards have been accepted by the Society:—

Ten Thousandths	(.010")	inch	large	for	first	oversize	standard	
Twenty "	(.020")	"	"	"	second	"	"	
Thirty "	(.030")	"	"	"	third	"		
Forty "	(.040")	"	"	"	fourth		"	

Index to Tables and Data appears on Pages 777 and 778.

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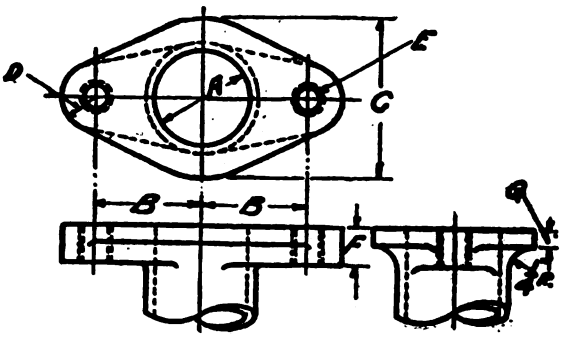
Carbureter Fittings (*S. A. E. Standard*)

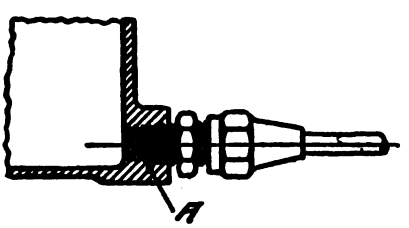
FLANGES



Carbureter Size	A	B	C	D	E *	F	G
3/4	15/16"	1 1/16"	1 5/8"	11/32"	5/16"x18 thr.	3/8"	1/8"
7/8	1 1/16"	1 1/8"	1 3/4"	11/32"	5/16"x18 thr.	3/8"	1/8"
1	1 3/16"	1 3/16"	1 7/8"	11/32"	5/16"x18 thr.	13/32"	5/32"
1 1/4	1 7/16"	1 11/32"	2 3/16"	13/32"	3/8" x16 thr.	15/32"	3/16"
1 1/2	1 11/16"	1 15/32"	2 1/2"	13/32"	3/8" x16 thr.	15/32"	3/16"
1 3/4	1 15/16"	1 21/32"	2 13/16"	15/32"	7/16"x14 thr.	9/16"	7/32"
2	2 3/16"	1 25/32"	3 1/8"	15/32"	7/16"x14 thr.	9/16"	7/32"

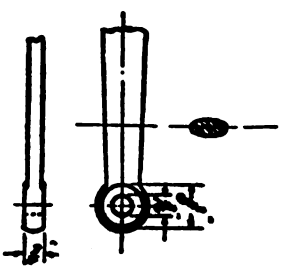
*U. S. Standard thread.
All dimensions in inches.

GASOLINE PIPE SIZES

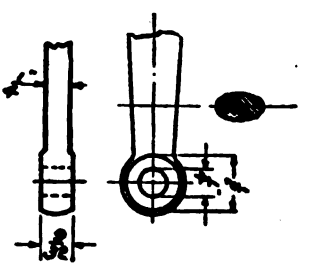


Carbureter Size	A, Briggs Standard. Pipe Thread
3/4"	1/2"
7/8"	1/2"
1"	1/2"
1 1/4"	1/2"
1 1/2"	1/4"
1 3/4"	1/4"
2"	1/4"

THROTTLE LEVERS



3/16" Rod end for carbureters up to 1 inch



1/4" Rod end for carbureters of 1 1/4 to 2 inch s inclusive

(*Continued on following page*)

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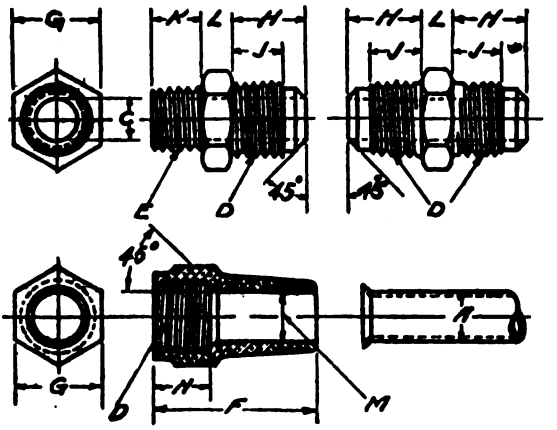
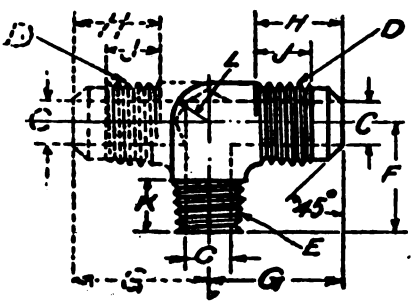
Carburetor Fittings (*S. A. E. Standard*)

FLARED TUBE UNIONS



A	Pipe diameter.....	1/4	5/16	3/8	7/16	1/2
C	Bore, male part.....	3/16	7/32	9/32	5/16	13/32
D	S. A. E. thread.....	7/16x20 thr.	1/2x20 thr.	5/8x18 thr.	11/16x16 thr.	3/4x16 thr.
E	Pipe thread.....	1/8	1/8	1/4	1/4	3/8
F	.....	15/16	1 1/8	1 5/16	1 1/2	1 5/8
G	.....	9/16	5/8	3/4	13/16	7/8
H	.....	1/2	9/16	5/8	11/16	3/4
J	Thread only.....	11/32	3/8	13/32	7/16	1/2
K	Thread only.....	3/8	3/8	7/16	7/16	1/2
L	.....	3/16	7/32	1/4	9/32	5/16
M	Bore, female part.....	0.255–0.260	0.317–0.322	0.380–0.385	0.442–0.447	0.505–0.510
N	.....	11/32	3/8	7/16	1/2	9/16

FLARED TUBE ELLS AND TEES



A	Tube diameter.....	1/4	5/16	3/8	7/16	1/2
C	Drill diameter.....	3/16	7/32	9/32	5/16	13/32
D	S. A. E. thread.....	7/16x20	1/2x20	5/8x18	11/16x16	3/4x16
E	Briggs std. pipe thread..	1/8	1/8	1/4	1/4	3/8
F	Center to face.....	3/4	3/4	7/8	15/16	1
G	Center to face.....	7/8	15/16	1	1 1/8	1 3/16
H	.....	1/2	9/16	5/8	11/16	3/4
J	Thread only.....	11/32	3/8	13/32	7/16	1/2
K	Thread only.....	3/8	3/8	7/16	7/16	1/2
L	Radius.....	1/8	1/4	9/32	5/16	11/32

All dimensions on this sheet in inch measure.

Index to Tables and Data appears on Pages 777 and 778.

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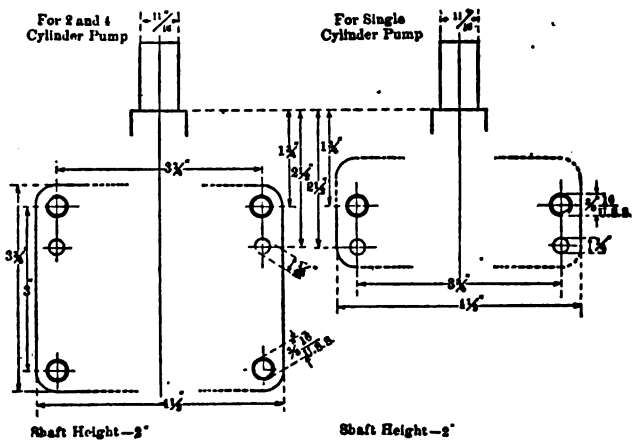
Mechanically Driven Air Pump Mounting Dimensions
(*S. A. E. Standard*)

Shaft height	2"
Shaft diameter	11/16"
Width of base (right angle to crankshaft)	4 1/2"
Length of base of two and four-cylinder pumps (parallel to crankshaft)	3 3/4"
Distance from center of front baseplate holes to shoulder of shaft	1 3/4"
Distance between centers of baseplate holes:	
At right angle to crankshaft	3 3/4"
Parallel to crankshaft	3"
Baseplate hole thread	3/8-16 U. S. S.
Dowels, two	1/4"

3¾" c to c, placed between pair of baseplate holes located on each side of crankshaft, and on a line 2½" from shoulder of shaft.



Magneto Mounting Dimensions (*S. A. E. Standard*)

For Four- and Six-Cylinder Engines

	Mm.	Inches
Shaft height	45.	1.771
Distance from center of front base-plate holes to large end of shaft taper	53.	2.086
Distance from center of front base plate holes to center of rear base-plate holes	50.	1.968
Distance between centers of base-plate holes left to right	50.	1.968
Large diameter of taper	15.	0.590
Small diameter of taper	12.	0.472
Length of taper	15.	0.590
Taper 1:5 (included angle) 11 deg. 30 min. approx. Woodruff key No. 3		
Height of magneto space	203.	8.000
Length of magneto space	254.	10.000
Width of magneto space	127.	5.000
Plain hole timing lever	6.35	0.25
Tapped hole timing lever, ¼ in. 28 P., S.A.E.		
Base-plate holes—⅜ in. 16 P., U.S.S.		
Thread for end of magneto shaft ⅜ in., 16 P., U.S.S., length of thread 0.5905 in.		
Advance lever radius	2.125 in.	

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Wheel Dimensions for Solid Tires (*S. A. E. Standard*)

Demountable and Non-demountable Rims

SINGLE TIRES

Width of felloe and band.....¾-inch less than sectional size of tire.
Thickness of steel band.....¼-inch up to 4-inch tire; ⅜-inch on 4-inch and larger tires.

DUAL TIRES

Width of felloe and band.....Twice the sectional size of tire.
Thickness of steel band.....⅜-inch for all sizes of tires.

SINGLE AND DUAL TIRES

Sectional size of tire.....	2	2½	3	3½	4
Minimum felloe thickness.....	1¼	1¼	1½	1½	1¾
Sectional size of tire.....	4½	5	5½	6	6½ and over
Minimum felloe thickness.....	1¾	2	2	2	2¼

Wheel Diameter Over Steel Band

Single and Dual Tires

Nom. outer diam. of tires	30		32		34		36		38		40			
Wheel diam. over steel band.....	24		26		28		30		32		34			
Exact circumf. over steel band; neglecting tolerance.....	75	25/64	81	11/16	87	31/32	94	1/4	100	17/32	106	13/16	113	3/32

Allowable Deviation From Precision in Felloe Bands

	Plus	Minus
Tolerance in circumf. of band before application.....	0	1/16"
Tolerance in circumf. of band after application.....	1/16"	1/32"
Tolerance in width of band.....	1/64"	1/64"
Tolerance of thickness of band.....	0.006"	0.006"
Tolerance in radius of band after application.....	1/16"	1/16"

Circumferential deviation from precise figure must be uniform across entire width of band.

Radial deviations must not occur at diametrically opposite points, and there must be no flat spots or kinks in band on finished wheel. Either side of band when laid on a surface plate must not clear more than 1/64" at any point.

Commercial Car Wheel Data

Bolt Equipment for Side Flanges

Bolts to be ½ Inch Diameter

Outside Diameter Tire	Diameter Bolt Hole Circle	Number of Bolts	Outside Diameter Tire	Diameter Bolt Hole Circle	Number of Bolts
26.....	18½	6, 9 or 18	42.....	34½	10, 15 or 30
28.....	20½	do.	44.....	36½	12, 18 or 36
30.....	22½	do.	46.....	38½	do.
32.....	24½	8, 12 or 24	48.....	40½	do.
34.....	26½	do.	50.....	42½	14, 21 or 42
36.....	28½	do.	52.....	44½	do.
38.....	30½	10, 15 or 20	54.....	46½	do.
40.....	32½	do.			

(*Continued on following page*)

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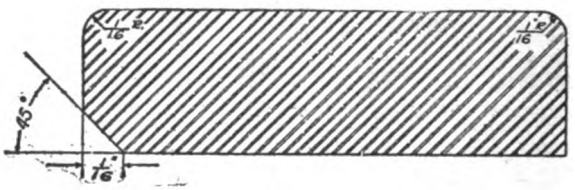
Edges of Felloe Band

Band to be rounded on the two outside edges with radius not to exceed 1/16", and one inside edge to have an angle of about 45 degrees, extending about 1/16" from the edge, as shown in the following sketch:



Measuring Circumference of Band

In measuring circumference of band, if there is not an allowance on the tapeline itself, a correction amounting to three times the thickness of the tapeline should be made.

Note.—All of the foregoing, so far as pertinent, applies to metal wheels.

SIZES AND TOLERANCES FOR ANNULAR BALL BEARINGS

(*S. A. E. Standard*)

Bore Tolerances

The tolerances given include the extremes for all makes of bearings, as endorsed by the ball bearing manufacturers. It has been the practice of some ball bearing manufacturers to work only to minus limits, while others work to tolerances on both sides of exact nominal sizes as to bore.

Where greater accuracy than specified by the tolerances given above is required, the same should be specified.

Definition of Eccentricity

The eccentricity of the inner race is that lack of running truth noticed upon the stationary outer race when rotating the inner race and balls upon true centers.

The eccentricity of the outer race is that lack of running truth shown upon a suitable indicator during the rotation of the outer race and balls upon the inner race fixed upon a stationary arbor.

Axial Freedom

In the absence of a standard method of measuring axial freedom, no definite figures for same have been accepted.

Short Type Roller Bearings

For short type roller bearings, whether plain or taper, the same sizes of bore and outside diameter as for annular ball bearings are standard.

Length of Long Ball and Roller Bearings

No effort is considered advisable at the present time to standardize the length of the so-called long ball or roller bearings.

Index to Tables and Data appears on Pages 777 and 778.

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SIZES AND TOLERANCES FOR ANNULAR BALL BEARINGS (*S. A. E. Standard*)

LIGHT SERIES

B'g. No.	Bore				Diameter				Width				Corners of the Outer Race and at Bore of* Inner Race		Eccentricity Tolerance in Inches	
	M.M.	Inches	Tolerance in Inches		M.M.	Inches	Tolerance in Inches		M.M.	Inches	Tolerance in Inches (for both races)		M.M.	Inches	Inner Race	Outer Race
			Plus	Minus			Plus	Minus			Plus	Minus				
200	10	0.39370	0.0002	0.0004	30	1.18110	0	0.0006	9	0.35433	0	0.002	1	0.04	0.0008	0.0012
201	12	0.47244	0.0002	0.0004	32	1.25984	0	0.0006	10	0.39370	0	0.002	1	0.04	0.0008	0.0012
202	15	0.59055	0.0002	0.0004	35	1.37795	0	0.0006	11	0.43307	0	0.002	1	0.04	0.0008	0.0012
203	17	0.66929	0.0002	0.0004	40	1.57481	0	0.0006	12	0.47244	0	0.002	1	0.04	0.0008	0 0012
204	20	0.78740	0.0002	0.0004	47	1.85040	0	0.0006	14	0.55118	0	0.002	1	0.04	0.0008	0.0012
205	25	0.98425	0.0002	0.0006	52	2.04725	0	0.0008	15	0.59055	0	0.002	1	0.04	0.0008	0.0012
206	30	1.18110	0.0002	0.0006	62	2.44095	0	0.0008	16	0.62992	0	0.002	1	0.04	0.0008	0.0012
207	35	1.37795	0.0002	0.0006	72	2.83465	0	0.0008	17	0.66929	0	0.002	1	0.04	0.0008	0.0012
208	40	1.57481	0.0002	0.0006	80	3.14962	0	0.0008	18	0.70866	0	0.002	2	0.08	0.0008	0.0012
209	45	1.77166	0.0002	0.0006	85	3.34647	0	0.0008	19	0.74803	0	0.002	2	0.08	0.0010	0.0016
210	50	1.96851	0.0002	0.0006	90	3.54332	0	0.0008	20	0.78740	0	0.002	2	0.08	0.0010	0.0016
211	55	2.16536	0.0002	0.0006	100	3.93702	0	0.0008	21	0.82677	0	0.002	2	0.08	0.0010	0.0016
212	60	2.36221	0.0002	0.0006	110	4.33072	0	0.0008	22	0.86614	0	0.002	2	0.08	0.0010	0.0016
213	65	2.55906	0.0002	0.0006	120	4.72443	0	0.0008	23	0.90551	0	0.002	2	0.08	0.0010	0.0016
214	70	2.75591	0.0002	0.0006	125	4.92128	0	0.0008	24	0.94488	0	0.002	2	0.08	0.0010	0.0016
215	75	2.95277	0.0002	0.0006	130	5.11813	0	0.0008	25	0.98425	0	0 002	2	0 08	0.0010	0.0016
216	80	3.14962	0.0002	0.0006	140	5.51183	0	0.0008	26	1.02362	0	0.002	3	0 12	0.0012	0.0018
217	85	3.34647	0.0002	0.0007	150	5.90554	0	0.0012	28	1.10236	0	0.002	3	0.12	0.0012	0 0018
218	90	3.54332	0.0002	0.0007	160	6.29924	0	0.0012	30	1.18110	0	0.002	3	0.12	0.0012	0.0018
219	95	3.74017	0.0002	0.0007	170	6.69294	0	0.0012	32	1.25984	0	0.002	3	0.12	0.0012	0.0018
220	100	3.93702	0.0002	0.0007	180	7.08664	0	0.0012	34	1.33858	0	0.002	3	0.12	0.0012	0.0018
221	105	4.13387	0.0002	0.0007	190	7.48035	0	0.0012	36	1.41732	0	0.002	3	0.12	0.0012	0.0018
222	110	4.33072	0.0002	0.0007	200	7.87405	0	0.0012	38	1.49607	0	0.002	3	0.12	0.0012	0.0018

*A chamfer of 45 degrees ground true with the bore and outside diameter is recommended.

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SIZES AND TOLERANCES FOR ANNULAR BALL BEARINGS (*S. A. E. Standard*)

MEDIUM SERIES

B'g. No.	Bore				Diameter				Width				Corners of the Outer Race and at Bore of* Inner Race		Eccentricity Tolerance in Inches	
	M.M.	Inches	Tolerance in Inches		M.M.	Inches	Tolerance in Inches		M.M.	Inches	Tolerance in Inches (for both races)		M.M.	Inches	Inner Race	Outer Race
			Plus	Minus			Plus	Minus			Plus	Minus				
300	10	0.39370	0.0002	0.0004	35	1.37795	0	0.0006	11	0.43307	0	0.002	1	0.04	0.0008	0.0012
301	12	0.47244	0.0002	0.0004	37	1.45669	0	0.0006	12	0.47244	0	0.002	1	0.04	0.0008	0.0012
302	15	0.59055	0.0002	0.0004	42	1.65355	0	0.0006	13	0.51181	0	0.002	1	0.04	0.0008	0.0012
303	17	0.66929	0.0002	0.0004	47	1.85040	0	0.0006	14	0.55118	0	0.002	1	0.04	0.0008	0.0012
304	20	0.78740	0.0002	0.0006	52	2.04725	0	0.0008	15	0.59055	0	0.002	1	0.04	0.0008	0.0012
305	25	0.98425	0.0002	0.0006	62	2.44095	0	0.0008	17	0.66929	0	0.002	1	0.04	0.0008	0.0012
306	30	1.18110	0.0002	0.0006	72	2.83465	0	0 0008	19	0.74803	0	0.002	2	0.08	0.0008	0.0012
307	35	1 37795	0.0002	0.0006	80	3.14962	0	0.0008	21	0.82677	0	0.002	2	0.08	0.0008	0.0012
308	40	1.57481	0.0002	0.0006	90	3.54332	0	0.0008	23	0.90551	0	0.002	2	0.08	0.0008	0.0012
309	45	1.77166	0.0002	0.0006	100	3.93702	0	0.0008	25	0.98425	0	0.002	2	0.08	0.0010	0.0016
310	50	1.96851	0.0002	0.0006	101	4.33072	0	0.0008	27	1.06299	0	0.002	2	0.08	0.0010	0.0016
311	55	2.16536	0.0002	0.0006	120	4.72443	0	0.0008	29	1.14173	0	0.002	2	0.08	0.0010	0.0016
312	60	2.36221	0.0002	0.0006	130	5.11813	0	0.0008	31	1.22047	0	0.002	2	0.08	0.0010	0.0016
313	65	2.55906	0.0002	0.0006	140	5.51183	0	0.0008	33	1.29921	0	0.002	3	0.12	0.0010	0.0016
314	70	2.75591	0.0002	0 0007	150	5.90554	0	0.0012	35	1.37795	0	0.002	3	0.12	0.0010	0.0016
315	75	2.95277	0.0002	0.0007	160	6.29924	0	0.0012	37	1.45669	0	0.002	3	0.12	0.0010	0.0016
316	80	3.14962	0.0002	0.0007	170	6.69294	0	0.0012	39	1.53544	0	0.002	3	0.12	0.0012	0.0018
317	85	3.34647	0.0002	0.0007	180	7.08664	0	0.0012	41	1.61418	0	0.002	3	0.12	0.0012	0.0018
318	90	3.54332	0.0002	0.0007	190	7.48035	0	0.0012	43	1.69292	0	0.002	3	0.12	0.0012	0.0018
319	95	3.74017	0.0002	0.0007	200	7.87405	0	0.0012	45	1.77166	0	0.002	3	0.12	0.0012	0.0018
320	100	3.93702	0.0002	0.0007	215	8.46460	0	0.0012	47	1.85040	0	0.002	3	0.12	0.0012	0.0018
321	105	4.13387	0.0002	0.0007	225	8.85830	0	0.0012	49	1.92914	0	0.002	3	0.12	0.0012	0.0018
322	110	4.33072	0.0002	0.0007	240	9.44886	0	0.0012	50	1.96851	0	0.002	3	0.12	0.0012	0.0018

*A chamfer of 45 degrees ground true with the bore and outside diameter is recommended.

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AMBU ELECTRIC REPAIR SHOP HELPS

Fewer Men Can Accomplish More With These Helps

The more men the army needs and takes —the more mechanical equipment must you put into your battery shop to get out the work. Therefore, NOW is the time you must help your men with these time and labor saving devices. And they are money makers for the shop, too.

AMBU BATTERY STEAMER

Softens up the "compound" and enables the men to get into the battery in the shortest time and with no chance of damaging the box. Many a shop has lost the profits on several jobs by having to replace battery boxes broken in opening. Takes but a few minutes to open any battery. Each $25.00

AMBU BATTERY PLATE PRESS

Probably one of the most valuable "salvage" devices. By pressing plates properly the life of a battery is doubled and new plate installations avoided. Made of specially finished wood, acid resisting. Saves its cost in the time lost cleaning up the metal vise that has been corroded with acid and water. Produces perfect plates in a short time. Each $32.50

AMBU PLATE BURNING RACK

The burning-in of new plates in a battery without a rack is a long hard job. The AMBU Plate Burning Rack makes it easy to do better work than any other way. Saves its cost on first three jobs. Each $7.50

AMBU LEAD MOULDS

Save all the old lead in your shop! Melt it down into usable form in these handy lead molds. Save their cost in salvaged metal in a few days. Every shop should have a pair and large shops should have several. Each $1.80. Per pair $3.50

"THE AUTOMOBILE STORAGE BATTERY"

A technical book in non-technical language that tells all the theory and actual practice in the care and repair of storage batteries. Should be in the office of every shop for reference. Postpaid $5.00

AMBU

TRADE MARK

Does the Work of an Expert Repair Man

Man shortage in every automobile repair shop makes AMBU equipment a necessity.

With an AMBU you can locate—almost instantly—any electrical trouble in the starting and lighting system of any car.

Think of all the old cars that must be used for another year or so and then think of all the electrical service they will need—there is your market, if you are equipped to care for the business.

The one and only way you can give satisfactory electrical service to car owners in your town is to equip your shop with AMBU.

It is not necessary for you to have a staff of experts—because AMBU is more positive than the best specialist.

Not only are garage men all over the country reaping additional income from the use of AMBU, but they are drawing new trade by making car owners come to them for authoritative tests and proper repairs on the electric systems of the cars—a service that can be delivered only with AMBU.

WRITE US TODAY for the complete story of AMBU, and let us show you how you can make a success of a one-man shop, or a larger one in proportion.

Every device listed here has been tested and is in use in the leading shops in the country. We guarantee entire satisfaction, or your money back without question.

If your jobber cannot supply you write direct

Write for our Booklet of Battery Shop Helps.

American Bureau of Engineering

1018 So. Wabash Avenue :: Chicago

Makers of AMBU Electric Trouble Shooter

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SIZES AND TOLERANCES FOR ANNULAR BALL BEARINGS (*S. A. E. Standard*)
HEAVY SERIES

B'g. No.	Bore				Diameter				Width				Corners of the Outer Race and at Bore of* Inner Race		Eccentricity Tolerance in Inches	
	M.M.	Inches	Tolerance in Inches		M.M.	Inches	Tolerance in Inches		M.M.	Inches	Tolerance in Inches (for both races)		M.M.	Inches	Inner Race	Outer Race
			Plus	Minus			Plus	Minus			Plus	Minus				
403	17	0.66929	0.0002	0.0006	62	2.44095	0	0.0008	17	0.66929	0	0.002	1	0.04	0.0008	0.0012
404	20	0.78740	0.0002	0.0006	72	2.83465	0	0.0008	19	0.74803	0	0.002	2	0.08	0.0008	0.0012
405	25	0.98425	0.0002	0.0006	80	3.14962	0	0.0008	21	0.82677	0	0.002	2	0.08	0.0008	0.0012
406	30	1.18110	0.0002	0.0006	90	3.54332	0	0.0008	23	0.90551	0	0.002	2	0.08	0.0008	0.0012
407	35	1.37795	0.0002	0.0006	100	3.93702	0	0.0008	25	0.98425	0	0.002	2	0.08	0.0008	0.0012
408	40	1.57481	0.0002	0.0006	110	4.33072	0	0.0008	27	1.06299	0	0.002	2	0.08	0.0008	0.0012
409	45	1.77166	0.0002	0.0006	120	4.72443	0	0.0008	29	1.14173	0	0.002	2	0.08	0.0010	0.0016
410	50	1.96851	0.0002	0.0006	130	5.11813	0	0.0008	31	1.22047	0	0.002	2	0.08	0.0010	0.0016
411	55	2.16536	0.0002	0.0006	140	5.51183	0	0.0008	33	1.29921	0	0.002	3	0.12	0.0010	0.0016
412	60	2.36221	0.0002	0.0007	150	5.90554	0	0.0012	35	1.37795	0	0.002	3	0.12	0.0010	0.0016
413	65	2.55906	0.0002	0.0007	160	6.29924	0	0.0012	37	1.45669	0	0.002	3	0.12	0.0010	0.0016
414	70	2.75591	0.0002	0.0007	180	7.08664	0	0.0012	42	1.65355	0	0.002	3	0.12	0.0010	0.0016
415	75	2.95277	0.0002	0.0007	190	7.48035	0	0.1212	45	1.77166	0	0.002	3	0.12	0.0010	0.0016
416	80	3.14962	0.0002	0.0007	200	7.87405	0	0.0012	48	1.88977	0	0.002	3	0.12	0.0012	0.0018
417	85	3.34647	0.0002	0.0007	210	8.26775	0	0.0012	52	2.04725	0	0.002	3	0.12	0.0012	0.0018
418	90	3.54332	0.0002	0.0007	225	8.85830	0	0.0012	54	2.12599	0	0.002	3	0.12	0.0012	0.0018
419	95	3.74017	0.0002	0.0007	250	9.84256	0	0.0012	55	2.16536	0	0.002	3	0.12	0.0012	0.0018
420	100	3.93702	0.0002	0.0007	265	10.43311	0	0.0012	60	2.36221	0	0.002	3	0.12	0.0012	0.0018

*A chamfer of 45 degrees ground true with the bore and outside diameter is recommended.

Index to Tables and Data appears on Pages 777 and 778.

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PARKER

Super-Size

CORD TIRES

OUR PURPOSE AND POLICY

TO make the finest super-sized cord tire that it is physically and mentally possible to build, and to have it permanently remain as such is the supreme purpose and policy of The Parker Tire & Rubber Company.

A positive, definite business policy has been adopted which includes the advertising and distribution as well as the production of PARKER super-sized cord tires.

No freak patents, airless or so-called puncture-proof experiments will ever enter into the construction of PARKER tires. The general principles of construction will not deviate from that which many years of successful experience in manufacturing tires has proven best.

THE PARKER TIRE & RUBBER CO.
INDIANAPOLIS, IND.

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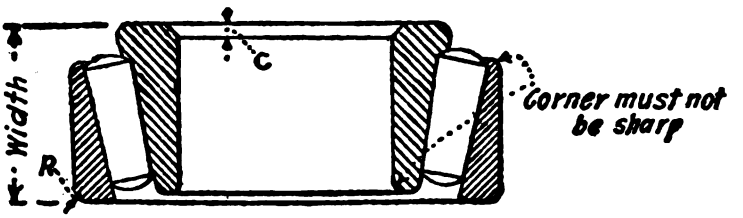
Roller Bearings

Narrow and Wide Series

S. A. E. Standard Sizes and Tolerances

(*Adopted in August*, 1916)



Bearing Number	Bore				Diameter				Width				Chamfer C Not Less than		Radius R		Eccentricity Tolerance in Inches	
	Mm.	In.	Tolerance in Inches		Mm.	In.	Tolerance in Inches		Mm.	In.	Tolerance in Inches		Mm.	In.	Mm.	In.	Inner Race	Outer Race
			Plus	Minus			Plus	Minus			Plus	Minus						
RM 204...	20	.78740	.0002	.0004	47	1.85040	0	.0006	19.05	¾	.020	.020	1	.04	1	.04	.0008	.0012
RM 205...	25	.98425	.0002	.0006	52	2.04725	0	.0008	19.05	¾	.020	.020	1	.04	1	.04	.0008	.0012
RM 206...	30	1.18110	.0002	.0006	62	2.44095	0	.0008	19.05	¾	.020	.020	1	.04	1	.04	.0008	.0012
RM 207...	35	1.37795	.0002	.0006	72	2.83465	0	.0008	22.22	⅞	.020	.020	1	.04	1	.04	.0008	.0012
RM 208...	40	1.57481	.0002	.0006	80	3.14962	0	.0008	25.40	1	.020	.020	2	.08	2	.08	.0008	.0012
RM 209...	45	1.77166	.0002	.0006	85	3.34647	0	.0008	25.40	1	.020	.020	2	.08	2	.08	.0010	.0016
RM 210...	50	1.96851	.0002	.0006	90	3.54332	0	.0008	25.40	1	.020	.020	2	.08	2	.08	.0010	.0016
RM 211...	55	2.16536	.0002	.0006	100	3.93702	0	.0008	30.16	1 3/16	.020	.020	2	.08	2	.08	.0010	.0016
RM 212...	60	2.36221	.0002	.0006	110	4.33072	0	.0008	34.92	1⅜	.020	.020	2	.08	2	.08	.0010	.0016
RM 213...	65	2.55906	.0002	.0006	120	4.72443	0	.0008	34.92	1⅜	.020	.020	2	.08	2	.08	.0010	.0016
RM 214...	70	2.75591	.0002	.0006	125	4.92128	0	.0008	36.51	1 7/16	.020	.020	2	.08	2	.08	.0010	.0016
RM 215...	75	2.95277	.0002	.0006	130	5.11813	0	.0008	36.51	1 7/16	.020	.020	2	.08	2	.08	.0010	.0016
RM 216...	80	3.14962	.0002	.0006	140	5.51183	0	.0008	41.27	1⅝	.020	.020	3	.12	3	.12	.0012	0018
RM 217...	85	3.34647	.0002	.0007	150	5.90554	0	.0012	44.45	1¾	.020	.020	3	.12	3	.12	.0012	0018
RM 218...	90	3.54332	.0002	.0007	160	6.29924	0	.0012	50.80	2	.020	.020	3	.12	3	.12	0012	0018
RM 219...	95	3.74017	.0002	.0007	170	6.69294	0	.0012	55.56	2 3/16	.020	.020	3	.12	3	.12	.0012	.0018
RM 220...	100	3.93702	.0002	.0007	180	7.08664	0	.0012	60.32	2⅜	.020	.020	3	.12	3	.12	.0012	0018
RM 221...	105	4.13387	.0002	.0007	190	7.48035	0	.0012	65.09	2 9/16	.020	.020	3	.12	3	.12	0012	0018
RM 222...	110	4.33072	.0002	.0007	200	7.87405	0	.0012	69.85	2¾	.020	.020	3	.12	3	.12	.0012	.0018
RM 304...	20	.78740	.0002	.0006	52	2.04725	0	.0008	22.22	⅞	.020	.020	1	.04	1	.04	.0008	.0012
RM 305...	25	.98425	.0002	.0006	62	2.44095	0	.0008	25.40	1	.020	.020	1	.04	1	.04	0008	0012
RM 306...	30	1.18110	.0002	.0006	72	2.83465	0	.0008	30.16	1 3/16	.020	.020	2	.08	2	.08	0008	0012
RM 307...	35	1.37795	.0002	.0006	80	3.14962	0	.0008	34.92	1⅜	.020	.020	2	.08	2	.08	.0008	.0012
RM 308...	40	1.57481	.0002	.0006	90	3.54332	0	.0008	36.51	1 7/16	.020	.020	2	.08	2	.08	.0008	.0012
RM 309...	45	1.77166	.0002	.0006	100	3.93702	0	.0008	39.69	1 9/16	.020	.020	2	.08	2	.08	.0010	.0016
RM 310...	50	1.96851	.0002	.0006	110	4.33072	0	.0008	44.45	1¾	.020	.020	2	.08	2	.08	.0010	.0016
RM 311...	55	2.16536	.0002	.0006	120	4.72443	0	.0008	49.21	1 15/16	.020	.020	2	.08	2	.08	.0010	.0016
RM 312...	60	2.36221	.0002	.0006	130	5.11813	0	.0008	53.97	2⅛	.020	.020	2	.08	2	.08	.0010	.0016
RM 313...	65	2.55906	.0002	.0006	140	5.51183	0	.0008	58.74	2 5/16	.020	.020	3	.12	3	.12	.0010	.0016
RM 314...	70	2.75591	.0002	.0007	150	5.90554	0	.0012	63.50	2½	.020	.020	3	.12	3	.12	.0010	0016
RM 315...	75	2.95277	.0002	.0007	160	6.29924	0	.0012	68.26	2 11/16	.020	.020	3	.12	3	.12	.0010	.0016
RM 316...	80	3.14962	.0002	.0007	170	6.69294	0	.0012	68.26	2 11/16	.020	.020	3	.12	3	.12	.0012	.0018
RM 317...	85	3.34647	.0002	.0007	180	7.08664	0	.0012	73.02	2⅞	.020	.020	3	.12	3	.12	.0012	0018
RM 318...	90	3.54332	.0002	.0007	190	7.48055	0	.0012	73.02	2⅞	.020	.020	3	.12	3	.12	.0012	0018
RM 319...	95	3.74017	.0002	.0007	200	7.87405	0	.0012	77.79	3 1/16	.020	.020	3	.12	3	.12	.0012	.0018
RM 320...	100	3.93702	.0002	.0007	215	8.46460	0	.0012	82.55	3¼	.020	.020	3	.12	3	.12	.0012	.0018

Index to Tables and Data appears on Pages 777 and 778.

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Sand Holes, Porosity, Imperfections, and Shrinkage Cracks, so common in the ordinary commercial Aluminum Alloys are practically overcome in "Acieral."

Acieral Castings machine easily. Saves cost in cutting tools, in the time element of lathe equipment and in the Mechanics' wages.

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The National Voice
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P. S. Read Brinker's Series of Motor Truck Articles

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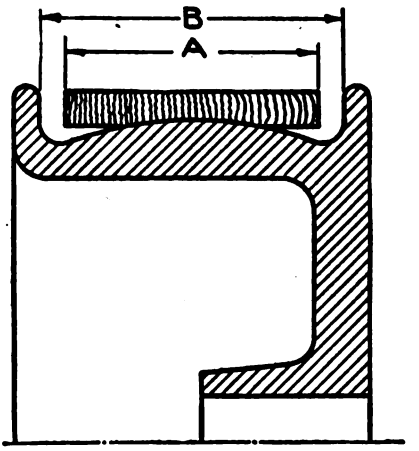
Fan Belts and Pulleys

S. A. E. Standard Widths



Nominal Belt Width	¾	1	1¼	1½
Belt width, A	23/32 to 25/32	31/32 to 1 1/32	1 7/32 to 1 9/32	1 15/32 to 1 17/32
Pulley width, B	0.870 to 0.880	1.120 to 1.130	1.370 to 1.380	1.680 to 1.690

All dimensions in inches.

Non-Ferrous Metal Tubing Tolerances

Tubing can be furnished in copper, and the commercial alloys of copper and zinc, such as high brass, bronze, phosphor bronze, and tobin bronze.

Composition.—As specified to meet the requirements of use.

Temper.—As specified in the order; may be hard, half hard or annealed. If annealed, the tubing may be soft, or light annealed.

Size variation.—On inside and outside diameter and the thickness of the walls, as follows:

Outside and Inside Dimensions

Up to ½ in. inclusive	0.002 in. over or under
Over ½ in. to and including ¾ in	0.0025 in. over or under
Over ¾ in. to and including 1 in	0.003 in. over or under
Over 1 in. to and including 1¼ in	0.0035 in. over or under
Over 1¼ in. to and including 1½ in	0.004 in. over or under
Over 1½ in. to and including 1¾ in	0.0045 in. over or under
Over 1¾ in. to and including 2 in	0.005 in. over or under
Over 2 in	¼ of 1 per cent. over or under

No combination of variations on the same tube shall make the thickness of the wall vary from the nominal by more than the following amounts:

Thickness of Wall

Up to and including 1/64 in	0.001 in. over or under
Over 1/64 in. to and including 1/32 in	0.002 in. over or under
Over 1/32 in. to and including 1/16 in	0.003 in. over or under
Over 1/16 in. to and including ⅛ in	0.005 in. over or under
Over ⅛ in. to and including ¼ in	0.008 in. over or under
Over ¼ in. to and including 5/16 in	0.0125 in. over or under
Over 5/16 in. to and including ⅜ in	0.015 in. over or under

Special limits.—On all stock where the above commercial variations are not permissible limits shall be specified in the order.

Index to Tables and Data appears on Pages 777 and 778.

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Absolute Protection

The 4 in 1

ILLUMINATED AT NIGHT

The Auto Indicator is a complete combination of signals—FOUR IN ONE. It indicates right and left turn, stop and go, as needed.

We have a special offer to make to dealers—write us today and we will send you full details.

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Department A

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Everything in Rubber for the Airplane.

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THE GOODYEAR TIRE & RUBBER COMPANY

Akron, Ohio, U. S. A.

MORRIS

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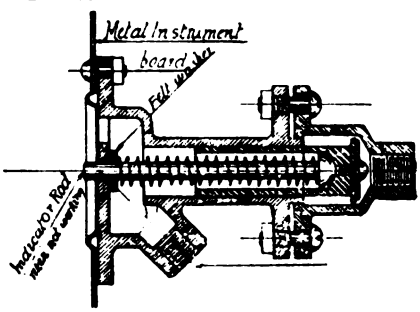

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Gets the timer out of its bad position—away from oil, mud and water.

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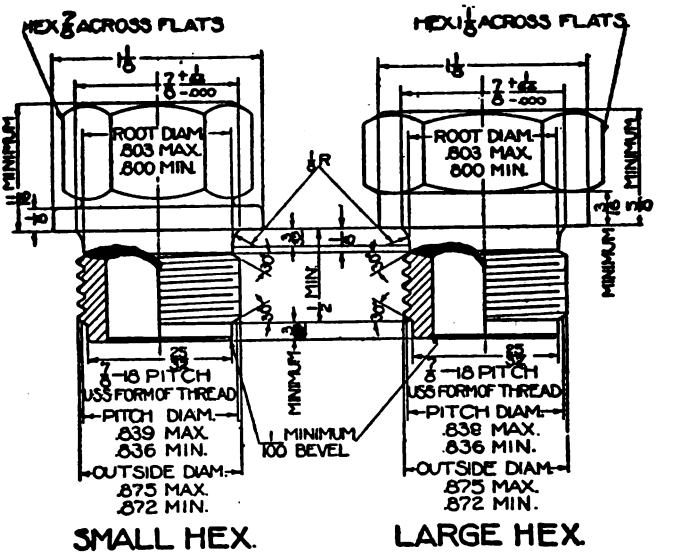
SPARK PLUG SHELL (*S. A. E. Standard*)



ALL DIMENSIONS BELOW SHOULDER ARE IDENTICAL FOR BOTH SPARK PLUG SHELLS

If spark plug taps are made to dimensions shown in the accompanying table, the plugs can be turned in by hand, using a wrench only for final tightening.

THREAD DATA

7/8—18 U. S. S. FORM OF THREAD

	Nominal Dimension	THREAD LIMITS	
		Spark Plug	Tap
Outside diameter.....	.875	.872 Min. .875 Max.	.877 Min. .879 Max.
Pitch diameter.....	.839	.836 Min. .839 Max.	.841 Min. .843 Max.
Root diameter.....	.803	.800 Min. .803 Max.	.805 Min. .807 Max.

Tap Drill Diameter
Nominal 13/16 = .8125
.810 Min. .813 Max.

All dimensions in inches.

Index to Tables and Data appears on Pages 777 and 778.

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THE STANDARD AUTO SIGNAL

is designed to give a positive warning to the car following when turning to the RIGHT or LEFT or STOP.

A DAY AND NIGHT SIGNAL

It is a welcome adjunct to motor pleasure. For protection against ACCIDENT RISK its purpose is an indispensable one.

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Saves time, money, trouble. Makes everyone an expert.

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Manufactured by

Simplex Auto Devices Co., Inc.

311 West 59th St. New York

Manufacturers are requested to send us copies of all catalogues as soon as issued. This will assist us in listing your name in this Directory under the proper classification or classifications and will then be placed in our file for reference.

THE AUTOMOBILE TRADE DIRECTORY
243-249 West 39th Street, New York

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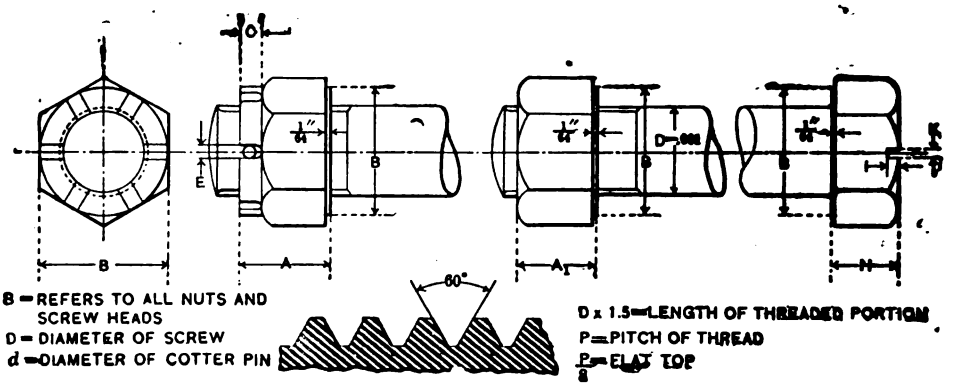
HEXAGON HEAD SCREWS, CASTLE AND PLAIN NUTS (*S. A. E. Standard*)

It is assumed that where screws are to be used in soft material, such as cast-iron, brass, bronze or aluminum, the United States standard pitches will be used

DIMENSIONS



D	1/4	5/16	3/8	7/16	1/2	9/16	5/8	11/16	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2
P	28	24	24	20	20	18	18	16	16	14	14	12	12	12	12
A	9/32	21/64	13/32	29/64	9/16	39/64	23/32	49/64	13/16	29/32	1	1 5/32	1 1/4	1 13/32	1 1/2
A^1	7/32	17/64	21/64	3/8	7/16	31/64	35/64	19/32	21/32	49/64	7/8	63/64	1 3/32	1 13/64	1 5/16
B	7/16	1/2	9/16	5/8	3/4	7/8	15/16	1	1 1/16	1 1/4	1 7/16	1 5/8	1 13/16	2	2 5/16
C	3/32	3/32	1/8	1/8	3/16	3/16	1/4	1/4	1/4	1/4	1/4	5/16	5/16	3/8	3/8
E	5/64	5/64	1/8	1/8	1/8	5/32	5/32	5/32	5/32	5/32	5/32	7/32	7/32	1/4	1/4
H	3/16	15/64	9/32	21/64	3/8	27/64	15/32	33/64	9/16	21/32	3/4	27/32	15/16	1 1/32	1 1/8
I	3/32	7/64	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	7/32	7/32	1/4	1/4
K	1/16	1/16	3/32	3/32	3/32	3/32	3/32	3/32	3/32	3/32	3/32	5/32	5/32	3/16	3/16
d	1/16	1/16	3/32	3/32	3/32	1/8	1/8	1/8	1/8	1/8	1/8	11/64	11/64	13/64	13/64

Dimensions. All dimensions in inches.
Finish. All heads and nuts to be semi-finish.
Material. For all screws and nuts—steel.
Screws are to be left soft. Screw heads are to be left soft. The plain nuts are to be left soft. The Castle nuts are to be case-hardened.

Index to Tables and Data appears on Pages 777 and 778.

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ARCHER

END-DUMP HOISTS AND BODIES

HAND OPERATED
1-2-3-4 and 5-TON SIZES.

Write for full data and prices

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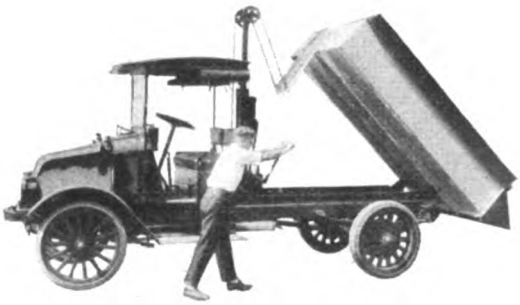

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INDIANAPOLIS IND.

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LARGE DIAMETER THREAD (*S. A. E. Standard*)

Diameter, Inches	Pitch		Diameter, Inches	Pitch	
	Coarse	Fine		Coarse	Fine
1⅝	12	16	3⅞	10	16
1¾	12	16	4	10	16
1⅞	12	16	4⅛	10	16
2	12	16	4¼	10	16
2⅛	12	16	4⅜	10	16
2¼	12	16	4½	10	16
2⅜	12	16	4⅝	10	16
2½	12	16	4¾	10	16
2⅝	12	16	4⅞	10	16
2¾	12	16	5	10	16
2⅞	12	16	5⅛	10	16
3	10	16	5¼	10	16
3⅛	10	16	5⅜	10	16
3¼	10	16	5½	10	16
3⅜	10	16	5⅝	10	16
3½	10	16	5¾	10	16
3⅝	10	16	5⅞	10	16
3¾	10	16	6 & over	8	16

All threads to be U. S. S. form.

Index to Tables and Data appears on Pages 777 and 778.

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Exclusive Sales Right To Dealers

Hardman "Sure Grip" non-skid tires offer a great opportunity to make money, because they are guaranteed for 5,000 miles and sell for "less" than other standard makes.

HARDMAN TIRES

are genuine hand made and new rubber is used in their manufacture.

Write us today for our terms to dealers; it will interest you.

Hardman Rubber Corp.

Belleville New Jersey

HYATT ROLLER BEARING

WHEREVER wheels turn—tractor, motor vehicle, factory, mine—there you will find Hyatt bearings reducing friction, saving wear, tear and labor.

HYATT ROLLER BEARING CO.

Tractor Bearings Division
CHICAGO
Motor Bearings Div.
DETROIT
Industrial Bearings Div.
NEW YORK CITY

18,000,000 Is a HELLOVALOT

We Booked That Many Pieces in One Month Last Year — WHY?

RIGHT } PRICES QUALITY DELIVERY

Anything in

Gears
Drop Forgings
Machined Parts
Metal Stamping (Light and Heavy)
Pistons
Piston Rings
Screw Machine Products
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Odd Fellows Bdlg. Indianapolis, Ind.

SHEPARD SALES CO.

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Combination Wrenches

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SPRINGFIELD, MASS.

Foundry Dept.,
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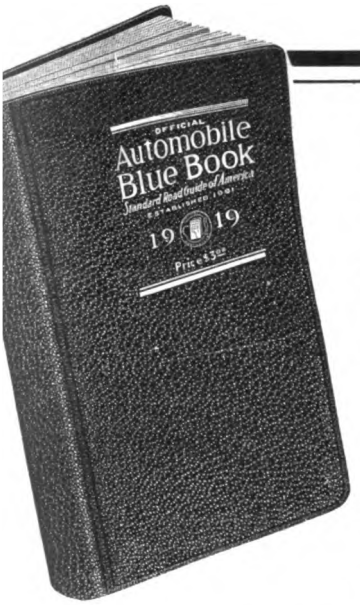

This is the book that will tell any motorist how to reach any place that can be reached by automobile—

America's Standard Automobile Road Guide

Published annually since 1901

Gives detailed running directions for every mile to any place that can be reached by automobile—tells how far any place is and whether the roads are good or bad—where to stop, where to eat, where to get gasoline or repairs and where the service stations are—what the speed laws and traffic regulations are enroute—gives ferry and steamship schedules—points out the historic and scenic places along the way—warns of curves, grades and dangerous crossings ahead—helps to plan tours—will tell any motorist exactly where he is at any minute of his trip.

This is essential information to every motorist. It will add to the pleasure of his tours. It will relieve him of care and worry.

PLANS TRIPS IN ADVANCE

Weeks before the start, with the help of the Blue Book motorists can plan their trips in every detail, from start to finish. The Blue Book will suggest new places to see, with new ways to go and return. Then, on the road, it will give them detailed directions for every mile of the way.

SAVES MONEY AND ANNOYANCE

The Automobile Blue Book will save its cost often on the first day's run by keeping motorists off the wrong, rough roads that waste gasoline, wear out tires, rack the car and waste time. It's annoying to ask questions, get wrong answers and have to turn back.

ACCURATE AND UP-TO-DATE

Roads change constantly, yet the Automobile Blue Book is always right up-to-date. Ten Blue Book Scout Cars are constantly on the road, charting new roads as well as re-charting old ones for corrections and changes. The only dependable motorists' road guide for 1919 is the 1919 Automobile Blue Book.

OVER 415,000 MILES OF AUTOMOBILE ROADS

The eleven volumes of the 1919 Automobile Blue Book contain detailed running directions for over 415,000 miles of automobile roads throughout the country, together with every bit of touring information that every motorist should have to make his trips a success.

Every volume averages about 1000 *pages, printed on good quality of India paper, with hundreds of maps and illustrations; staunchly bound in "Royal Blue" limp binding, stamped in gold. Price per volume,* $3.00 *net, or* $3.15 *postpaid.*

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will double the usefulness of a Blue Book

Built with a transparent face of celluloid—it enables the motorist to keep an open book before him in any wind or any weather. Two pages are constantly before him and pages may be turned without removing the book from the holder.

In genuine leather, "Royal Blue" finish . . . . . $3.00 each
In imitation leather, "Royal Blue" finish . . . . $2.00 each

Same discounts to the trade as on Blue Books.

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A Volume for Every Section

All uniform in style, size and binding

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Eleven Volumes in all

VOLUME 1—N. Y. State and Adjacent Can. Including L. I. and adjacent States as far as New Haven, Danbury and Waterbury, Ct.; Pittsfield, Mass.; Rutland and Burlington, Vt.; Cleveland, O.; Pittsburgh, Wilkes-Barre, Scranton and Delaware Water Gap, Pa.; Trenton, Asbury Park and Atlantic City, N. J.

VOLUME 2—New England and Maritime Provinces. Including L. I., New York City and Eastern New York State as far as the eastern shore of the Hudson; also Albany, Lake George and Lake Champlain Sections, Montreal and Quebec.

VOLUME 3—N. J., Pa., Del., Md., D. C., Va. and W. Va. Including all main highways out of New York City with extension routes into Southern New York State, Eastern Ohio to Canton and Cleveland.

VOLUME 4—Mich., Ind., Ohio and Ky. Including extension routes into adjacent States and trunk-line routes across Illinois to Chicago, excepting Upper Peninsula of Michigan, which is included in Vol. 5.

VOLUME 5—Ill., Minn., Wis., Ia. and Mo. Including Upper Peninsula of Michigan, and extension routes into all adjacent States.

VOLUME 6—The Southeastern States. Including W. Va., N. C., S. C., Ga., Fla., Ala., Miss., La. and Tenn., with extension routes into adjacent States, including Washington, D. C.

VOLUME 7—Mont., Wyo., Colo., New Mex., Tex., N. D., S. D., Neb., Kan., Okla., Ark. and La. With extension routes to Spokane, Salt Lake City and Phoenix, and trunk-line routes eastward to the Mississippi River.

VOLUME 8—Cal., Nev., Utah and Ariz. With extension routes into Ore., Tex. and N. Mex.

VOLUME 9—Wash., Ore., Ida. and B. C. With extension routes into Cal., Mont. and two trunk-lines to Salt Lake City.

VOLUME A—New York City Metropolitan Blue Book. Including 200 round trips within a radius of 100 miles of New York—half-day, full-day, week-end and three-day runs.

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The above discounts are effective September 2, 1918, cancelling all previous lists.

THE AUTOMOBILE BLUE BOOK PUBLISHING COMPANY

Chicago
910 South Michigan Avenue

New York
243 West 39th Street

San Francisco
513 Pacific Building

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NATIONAL AUTOMOBILE AND ALLIED ORGANIZATIONS

National Automobile Chamber of Commerce, Inc.

7 East 42d St., New York, N. Y.

Objects: To foster the interests of those engaged in the trade or business of manufacturing automobiles and all other self-propelling vehicles.

To reform abuses relative thereto.

To secure freedom of its members from unjust or unlawful exactions.

To diffuse accurate and reliable information as to the standing of merchants and others dealing with members as to all inventions, patents, processes or devices designed or intended for use in, upon, or in connection with such vehicles and the manufacture thereof, as to the state of the art relative thereto, and as to the condition and development of the trade in which the members are engaged, in the United States and foreign countries.

To procure uniformity and certainty in the customs and usages of such trade.

To promote the construction of better highways.

To advocate the enactment of just and equitable laws affecting members.

To settle differences between members.

To promote a more enlarged and friendly intercourse among business men engaged in such trade or dealing with persons engaged therein.

To acquire by grant, gift, purchase, devise or bequest, to hold and to dispose of such property as the purposes of the corporation shall require, subject to such limitations as may be prescribed by law, including inventions, letters patent and processes, or rights thereunder, for the benefit of its members and not for pecuniary profit.

Officers

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Vice-President, Hugh Chalmers
Second Vice-Presidents:
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Windsor T. White, Commercial Vehicle Division
Gen. Manager, Alfred Reeves
Secretary, C. C. Hanch
Treasurer, H. H. Rice

Society of Automotive Engineers, Inc.

29 W. 39th St., New York, N. Y.

Object: To promote the arts and sciences connected with engineering and mechanical construction of automotive apparatus.

Officers

President	Chas. F. Kettering
First Vice-President	David Beecroft.
Second Vice-President	C. C. Hinkley
Treasurer	C. B. Whittelsey
Secretary and General Manager	Coker F. Clarkson

Automobile Trade Credit Association

120 Broadway, New York, N. Y.

Object: To protect members against irresponsible debtors; collect and disseminate credit information

Officer

Secretary and Treasurer, Franz Neilson, 120 Broadway, New York, N. Y.

The National Association of Automobile Accessory Jobbers

1813-1818 City Hall Square Building, Chicago, Ill.

William M. Webster, Commissioner
President. S. F. Beech, Illinois
Vice-President, P. H. Lyon, California
Chairman of the Board of Directors, R. R. Englehart, Iowa

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Motor and Accessory Manufacturers

33 West 42d St., New York, N. Y.

Objects: To promote in all lawful ways the interests of makers of motors, motor parts, and accessories.
To aid in the protection of its members.
To secure the advantages to be obtained by mutual co-operation.
To facilitate the collection of the claims of its members and the diffusion of information concerning trade dealers, credits, and other matters of interest to the members of the Association.
To co-operate with similar associations in other states.

Officers

President, C. W. Stiger
First Vice President, C. E. Thompson
Second Vice-President, E. H. Broadwell
Third Vice-President, T. J. Wetzel
Treasurer, L. M. Wainwright
Secretary and Asst. Treasurer, W. O. Rutherford
Manager, L. M. Bradley

American Automobile Association

501 Fifth Ave., New York, N. Y.; Riggs Bldg., Washington, D. C.

Objects: To unite in one body all the automobile associations and individual motorists of the country; to secure reasonable and just legislation.
To aid in proper enforcement of automobile laws and ordinances; to advocate and obtain local, State and Federal aid in the construction and maintenance of good roads.
To encourage touring, and to secure, prepare, and disseminate information relative thereto; and
To support sportsmanlike contests and other movements that will advance motoring interests.

Officers

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A. G. Batchelder, Executive Board.
Carl G. Fisher, Touring Board.
George C. Diehl, Good Roads Board.
Richard Kennerdell, Contest Board.
W. Eugene Turton, Legislative Board.

The Rubber Association of America, Inc.

52 Vanderbilt Avenue, New York, N. Y.

Objects: To promote in all lawful ways the commercial interests of its members and to secure the advantages to be obtained by mutual co-operation.
To acquire and disseminate information concerning trade conditions at home and abroad, credits and other matters of interest.
To stimulate social intercourse among those connected with the rubber industry and commerce.
In general to promote the welfare of the rubber industry.

Officers

President, Bertram G. Work
First Vice-President, Harry T. Dunn.
Second Vice-President, Homer E. Sawyer.
Secretary and Treasurer, Harry S. Vorhis.

Motor Truck Association of America, Inc.

1790 Broadway, New York, N. Y.

Objects: To encourage the efficient use of auto trucks and protect users against unjust taxes or unreasonable restrictions of any character.
To serve as a basis for a strong national organization of those interested in the commercial use of motor trucks and within our present membership district.

Officers

President, David G. Fenner
Executive Secretary, T. D. Pratt

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Make your Dollars *Thrifty* Dollars

As a nation we've not been a saving people—we've lived up to the last cent. We've felt a pride in the luxuries of our table, our establishment, our manners of life. Then came the war and its merciless demands to *give*.

From somewhere must come the ships, the shells, the food which will sustain the boys who fight. And from somewhere must come the money to pay for these. From where?

From the useless things we wasted. From the weakening habits which have cost us health and money. From the "more-than-enough" margin we've thrown away. We must save. The purchase of War Savings Stamps will help us. Into these we must put the *wasted* gasoline, the *uneaten* food, the treatings, the entertainments—all the unessentials which must pay for this war. From these we can hope to create the Democracy of the world, and to shorten the war as well.

Buy your War Savings Stamps bountifully. Take a pledge to buy them monthly. Think afterwards of what can be sacrificed. In this way you can begin to save. Your own conscience will be your gauge—your own intelligence can tell you where to draw the line. In this way you can take your self-respecting part in the Victory to come.

NATIONAL WAR SAVINGS COMMITTEE, WASHINGTON

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COMMERCIAL CARS—

We have an ideal Front and Rear Axle equipment for 1500-pound Commercial Cars of 25 to 35 Hp., designed for pneumatic tires. Can be furnished for torque arm or Hotchkiss drive complete with propeller. Gear reduction 6 to 1.

PASSENGER CARS—

We can furnish you with Front and Rear Axles for 4, 6 or 8-cylinder cars up to 55 Hp., and weights ranging up to 3800 pounds.

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We manufacture high-grade artillery type wheels for both passenger and light Commercial cars.

We are pioneers in the manufacture of Axle and Wheel products, and our years of experience with many car manufacturers have fitted us to give you service equalled by few companies.

We use only the most modern manufacturing methods, and furnish high-grade material and workmanship.

Let us figure on your needs and quote you prices.

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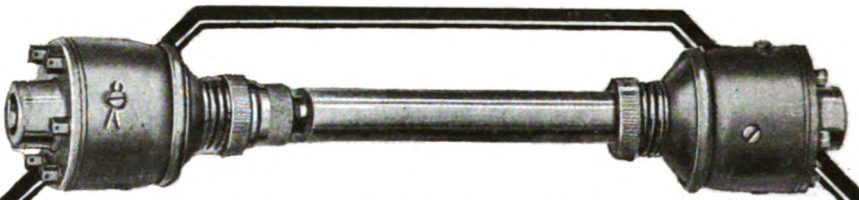

Standard Since 1906

Hartford

Universal Joints and Cone Clutches

THE FACTORY

More than doubled in size and capacity. The skilled workmen in correspondingly increased numbers. The engineering staff larger than ever. *Result: Production traveling abreast of heavy orders.*

THE PRODUCTS

Same carefully selected materials. Same Hartford correct design. Same careful turning out of finished products from raw steel to tested perfection.

"Hartford Cone Clutches and Universal Joints for big and little trucks." Write our engineering department. We co-operate.

The Hartford Auto Parts Company
HARTFORD, CONN.

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"In spite of the fact that Non-Gran Bronze costs more than other bearing bronzes, we have proven that its use saves us money."

So spoke the foremost manufacturer in this country of a certain class of electrical apparatus. And because he knew this statement to be a fact he was glad to go on record.

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NON-GRAN
BEARING BRONZE

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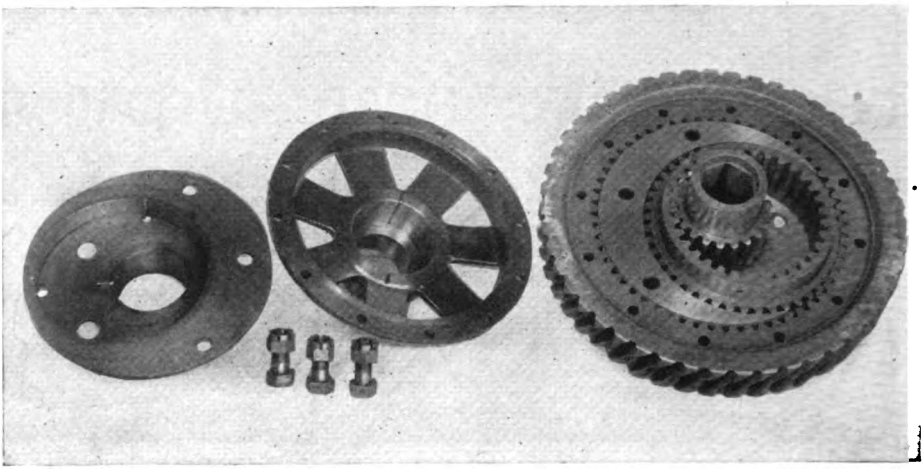
100% EFFICIENT

Non-Locking and Non-Frictional



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Our best Automobile Engineers and Mechanical Experts all agree that in order to obtain the greatest efficiency in driving power it is necessary to equip both commercial and pleasure cars with positive drive differentials.

We have placed a number of our differentials on trucks throughout the United States, and after giving them the severest tests possible we have torn them down, only to find that they do not show the slightest sign of wear. They are cheaper to manufacture than the standard type of differential and unlike any other type of so-called positive drive differential now on the market, they are absolutely free from any locking or frictional action whatever. Send us blue prints of your axle, and we will be glad to make you drawings of our differential suited to your requirements.

You are providing your salesmen with the strongest selling argument when you specify our differentials as standard equipment on your output.

THE B. F. EVERITT COMPANY

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